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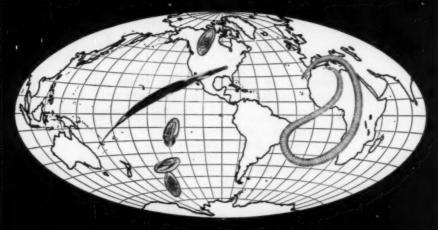
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Effects of Pancreatectomy

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Dr. L. L. Bennett is chairman of the department of physiology. He received his M.D. from the University of California and joined the faculty of the medical school in 1942. He became chairman of the department in 1953. He became a Commonwealth Fund fellow at Harvard in 1948.

Dr. W. F. Ganong is assistant professor of physiology. He received his M.D. from Harvard, and was formerly director of the Surgical Research Laboratory at Harvard, 1952-55. He joined the faculty at the University of California as assistant professor in 1955.

Preparation of a Syllabus in Social Medicine

Dr. Thomas McKeown has been professor of social medicine, University of Birmingham, Birmingham, England, since 1946. He received his M.D. from that University also. Dr. McKeown is editor of The British Journal of Social Medicine.

A Consideration of Preceptorial Medical Education

Dr. Walter S. Wiggins is associate secretary of the Council on Medical Education and Hospitals of the AMA. He received his M.D. from Jefferson Medical College. From 1952 to 1954 he was assistant dean, State University of New York College of Medicine at Syracuse.

Dean F. Smiley, editor Barbara M. Peterson, assistant editor Neva V. Resek, circulation manager Mary E. Parrilli, advertising secretary

An article by Dr. Wiggins, "The Aim of Continuation Medical Education," appeared in the May 1954 issue of the Journal.

The Training of Psychiatric Residents in Consultative Skills

Dr. Robert H. Barnes is director of educational services, The Greater Kansas City Mental Health Foundation. He received his M.D. from Duke University. and was formerly assistant professor of psychiatry in the school of medicine there, and psychiatric consultant to the North Carolina Dept. of Public Health.

Dr. Ewald W. Busse is professor of psychiatry and chairman of the department, Duke University School of Medicine. He was formerly professor and head of the department of psychoso-matic medicine, University of Colorado. He received his M.D. from Washington University, Saint Louis.

Dr. Bernard Bressler is associate professor of psychiatry at Duke University School of Medicine. He received his M.D. at Washington University, Saint Louis.

Predictor Variables Used in Research on the Selection of Medical Students

Dr. Edward Gottheil received his Ph.D. in clinical psychology from the University of Texas, and his M.D. from the University of Texas Southwestern Medical School. At present he is in the military service stationed in San An-

tonio, Texas. Dr. Carmen Miller Michael received her Ph.D. in clinical psychology from Western Reserve University, and is chief psychologist in the department of psychiatry at Southwestern Medical School. She is also president of the Texas Society for Mental Health.

Medical Education in 19th Century France

Dr. Erwin H. Ackerknecht is director of the Institute of the History of Medicine of the Faculty of Medicine, Zurich, Switzerland. He was formerly professor of the history of medicine. University of Wisconsin Medical School, and organized the Journal's series on the History of Medical Education, of which this article is the sixth.

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International Congress on Dermatology—July 31-August 6: Stockholm, Sweden.

Annual Congress on Industrial Health—February 4-6; Biltmore Hotel, Los Angeles.

Annual Congress on Medical Education and Licensure—February 10-12; Palmer House, Chicago.

Sixth International Congress of Otolaryngology
—May 5-10. Washington, D. C.

Annual Meeting of the National Tuberculosis
Association and the American Trudeau Society—May 5-11, 1957. Kansas City, Mo.

International Congress on Medicine and Surgery—June 1-9, 1957, Turin, Italy.

Canadian Medical Association—June 17-21; Edmonton, Alberta, Canada.

International Congress of Neurological Sciences
—July 21-28, 1957. Brussells, Belgium.

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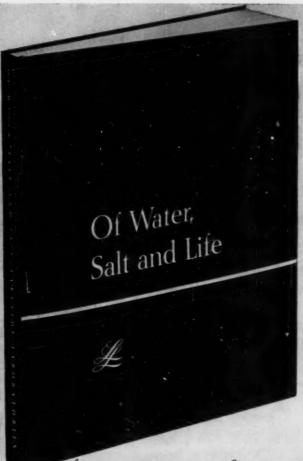
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Effects of Pancreatectomy

A Group Exercise in Physiology and Physiological Chemistry

E. L. DUGGAN, R. A. FINEBERG, H. TARVER, L. L. BENNETT AND W. F. GANONG

Introduction

THE past four years have seen the introduction of a challenging group exercise which has been completed by 12 sections of medical students. It has been supervised as a joint project by faculty from the two departments concerned. Its objective is to observe the effects of pancreatectomy in dogs, and the alleviation of these effects by appropriate therapy.

The exercise vividly illustrates a variety of disturbances in the metabolism of all the major foodstuffs as well as in acid-base, water and electrolyte balances. The actions of several hormones are involved as well as the homeostatic mechanisms of respiration and kidney function. The results of the exercise stress the interrelations of many aspects of physiology and biochemistry, and furnish a concrete example of integration of subject matter from both courses.

Analyses are performed at intervals after the withdrawal of insulin therapy from depancreatized dogs. Baseline data are obtained either before withdrawal or after reinstitution of therapy, so that each animal serves as its own control. Using the techniques available to the students

after some 36 laboratory periods, a large number of parameters can be studied.

Preparation and treatment of animals

Female mongrel dogs weighing 6 to 12 kg. were pancreatectomized under nembutal anesthesia. For one to two months postoperatively they were fed 6.5 oz. of Ken-L-Ration (Quaker Oats Co., Chicago, Ill.) and 0.5 oz. of raw beef pancreas twice a day. Eight units of crystalline insulin were given subcutaneously before each feeding. On this regimen, the dogs lost weight slowly, but ate well and their wounds healed without incident.

Organization and scheduling

The class of approximately 80 students was divided into 15 groups composed of 5 to 6 students per group. Each group was provided with a depancreatized dog. A chairman was appointed for each group. The members were provided with specific assignments and notes on the experimental procedures.

The exercise required 9 to 10 days of analyses, during a two week period, using one free day in addition to the combined laboratory hours of the two courses. The various analyses were completed on the day of sampling. The values obtained were recorded by the group chairman on an 11 x 16 inch tabular sheet. Representatives of each group conferred daily with a physiologist and biochemist, regarding technical difficulties, the significance of available data, and the start of therapy. A two hour discussion was held for the section about a week after termination of the exercise. The data from several groups were mimeographed and served as an inexhaustible source of questions and discussion.

Experimental details

For the two-week period of observation by the medical students the dogs were placed in metabolic cages which provided for the collection of 24 hour urine samples. Blood samples (15 ml.) were obtained from the femoral vein under faculty supervision. The dogs were weighed daily. At that time notes were made of the animal's general condition as well as of the presence of vomiting, diarrhea or abnormal respiration. The estimated quantity of food refused by the animal was recorded.

The usual sampling protocol is shown in Table I. The dogs were maintained on insulin for three days. Insulin was then discontinued for the remainder of the two-week period. The students followed the concentration of glucose Na, K, bicarbonate, and chloride, and the hematocrit in the blood samples. The volume, pH, titratable acidity, organic acids, total cation, ammonia, glucose, total nitrogen, urea nitrogen and creatinine of the urine were also measured.

The student assignments are given in Table II. Students A and C were chosen for special qualities, the first being a careful worker, to protect the pH meter assembly, the second being a leader.

Observations and results

The data obtained by one student group are presented in Table III. The headings indicate the standard units for the various analyses. In general, the dogs were not clinically very sick, but the analyses showed clearcut and often dramatic chemical changes.

We recognize that a number of aspects of metabolism and clinical chemistry may be illustrated by such sets of data obtained by the students. While instructors may set their own minimum standards of interpretation, we have considered that the following topics should be included in the two hour panel discussion which follows completion of the exercise:

- 1. Primary "biochemical lesion."
- 2. Evidence for increased gluco-neogenesis.
- 3. Evidence for increased lipid metabolism.
- 4. Carbohydrate, nitrogen and caloric balances (estimates derived from the urine analyses and the food analysis provided with the Ken-L-Ration®.)
- 5. Evidence for cation losses during the organic acidosis.
- 6. Picture of acidosis as provided by the blood analysis (12).
 - 7. Possible modes of therapy.

We do not view the experiment only as a study of diabetes as a disease to be controlled by these future physicians. Rather, we consider the exercise is a practical approach to an experimental discription of deranged carbohydrate and protein metabolism. The dehydration, cation losses and acidosis which are shown by the dogs are also of teaching value.

It is difficult to assess the experiment as a teaching device. Many

TABLE I

Details of Treatment and Sample Collection

Expe	y of riment	Riood Sample	Start Urine Collection	Therapy
1 2 3	M Tu W	11 A.M. 9 A.M.	X*	insulin
4	Th	**		no insulin
6	Sa	omit		88
7	Su	**	X*	99
8	M	9 A.M.	×	99
9	Tu	**	X	89
10	w	99	×	14
11	Th	**	X	98
12	F	9.0	-	98

*Collection will be started by animal man at 9 A.M.

TABLE II

Analytical Assignments*

Stu	dent	Task	Stud	ient Task
A	1.	Urine collection " volume		Weigh the dog Collect 15 ml. blood sample (Reserve 1 ml., rest for E)
	5.	" pH Titratable acidity (1) Organic acids (1) Total cation (2)		3. Perform hematocrit (5) 4. Prepare blood fitrates (6) 5. Blood glucose (7) 6. Urine (7)
В	1.	Aid tasks A 5 and A 6 Urinary ammonia (3) " urea (1) " creatinine (1)	E	1. Alkali reserve, plasma (8,11) 2. Plasma chloride (9) 3. Dilute plasma for Na and K** 4. Check plasma for lipemia (0,0,0)
С	2.	Total urinary nitrogen (1) Paper chromatography of urinary keto acids (4) Collect and report data Check calculations		Do task B 4 Do independent analysis (B 3) Help with task C 2

*Literature references for the individual methods are given in parentheses.

**Plasma sodium and potassium determinations were performed by a faculty member using a flame photometer (10).

†Assignments listed under F are given for the occasional 6th member of a group.

TABLE III

Effects of Insulin Withdrawal from Departmentized Dogs

Date	4/9	4/10	4/11	4/12	4/16	4/17	4/18	4/19	4/20	
Dog Weight, Kg.	9.5	9.25	9.1	9.1	8.7	8.5	8.6	8.6	8.4	
Blood gluc. mg. %	110*	364	308	268	332	318	396	228	273	
Alk. Res., meg./1.	21.4	25.0	21.0	22.0	17.8	16.2	12.8	13.0	13.5	
CI lon, meq./1.	117	117	120	124	122	117	123	121	121	
K ion, meq./1.	3.4	4.0	8.3	4.3	4.4	_	4.4	5.7	3.9	
Na ion, meg./1.	154	113	170	145	147	-	132	137	137	
Hematocrit, %	46	43	37.5	36	38	41.5	39	37	37.5	
Lipemia, 0 to 4°	1*	1.	0	0	1*	1*	0	0	0	
Urine volume, 1.		0.5	0.5	0.6	0.9	0.7	1.1	1.3	0.8	
pH		6.7	6.2	6.5	5.8	5.9	5.4	5.5	5.4	
glucose, gm./24 hrs.		15.8	14.5	22.2	39.0	42.0	82.5	47.0	53.0	
total N. am./24 hrs.		3.5	5.6	4.8	8.4	5.9	7.2	9.5	11.4	
total cation, meg./24 hrs.		42.5	44.8	58.8	97.5	109	164	296	168	
NH ₃ , meg./24 hrs.		10.9	11.4	8.49	17.0	26.3	33.4	39.0	42.0	
org. acids, meg./24 hrs.		36.4	34.6	30.8	98.6	131	155	162	118	
titr. acidity, meq./24 hrs.		1.00	8.36	4.52	19.6	20.5	26.8	23.4	19.6	
creatinine, mg./24 hrs.		250	410	279	345	299	420	494	272	
therapy	insulin				no treatment					

^{*2} hrs. after insulin; remaining blood samples are fasting samples taken before insulin.

students consider the experiment to be the high spot of the biochemistry laboratory course. As a means of stimulation of medical students to achieve mastery of biochemical principles, the experiment is excellent. The success of the exercise is indicated by the panel discussions in which the alert students, by their questions, penetrate quickly to the limits of existing knowledge.

The repetition of the experiment in its present form during a 3-year period has yielded a number of valuable results: It encourages close cooperation between the staff members concerned. It leads to tight organization of the laboratory in both courses to allow the exercise. Further, the participation of 4 to 6 faculty members in the panel conference permits the stimulating interplay of ideas from the specialized interest of each to the common discussion.

Summary

A group exercise for first year med-

ical students in physiology and physiological chemistry is described. The exercise involves the accumulation of biochemical data on depancreatized dogs during insulin withdrawal. The experiment provides an integrative approach to blood and urine analyses, as these serve to define the abnormal state of the animals. Medical students participate with intense interest, in place of the patient boredom commonly accorded more traditional analytical series.

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Un nuevo método para el estudio de los efectos de la pancreotomia

Los autores de este artículo, que pertenecen a los Departamentos de Química Fisiológica, y de Fisiología, de la Escuela de Medicina de la Univ. de California (Berkeley), tratan de un nuevo método, para estudiantes de Medicina de primer año, de observar los efectos de la pancreotomía así como el alivio de éstos. Dicho experimento en la enseñanza, que fué iniciado hace 4 años en la mencionada Escuela, consiste en la división de una clase de 80 estudiantes en grupos de cinco o seis, a cada uno de los cuales se le asigna una tarea determinada en la preparación, tratamiento y observación de los perros cuyos pancreas han sido extirpados, así como en la acumulación de datos bioquímicos relativos a los efectos que tienen lugar después que se deja de dar insulina a los perros. Todos los procedimientos aplicados están descritos detalladamente en el presente trabajo, y sus resultados aparecen ilustrados por medio

de varias tablas. Tambien se discute aquí el valor para la enseñanza de dicho experimento. Los autores son de la opinión que los ejercicios de grupo constituyen un modo de integración de los resultados de los análisis de sangre y orina que sirven para definir el estado anormal de los animales operados. Esos ejercicios estimulan, además, una cooperación estrecha entre los miembros de diversos Departamentos y los estudiantes que participan en el experimento, ya que las discusiones que regularmente forman parte de los ejercicios, a los que asisten cada vez de cuatro a seis profesores, permiten un interesante intercambio de ideas. Durante el período en que el nuevo método ha sido aplicado, los estudiantes que participaron en él mostraron interés y entusiasmo inusitados por el experimento.

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un minimum de 25 lectores.

The Preparation of a Syllabus in Social Medicine

THOMAS McKEOWN

T THE OUTSET the teacher of social medicine* is confronted by two difficulties. In the first place he cannot assume that the student starts with a clear conception of this subject, in the sense in which he knows that anatomy is concerned with structure, physiology with function and obstetrics with childbearing. Secondly, a considerable part of his subject matter has been added to the curriculum so recently that there has not been time for it to be assimilated into the tradition of medical education; consequently if the student finds the instruction uninteresting he is likely to regard it it as unnecessary. The essential requirements in a satisfactory syllabus spring from these two difficulties. It should provide the coherent conception of the subject which the student cannot provide for himself, and should be so arranged as to provoke an interest which cannot be assumed to exist.

In most other subjects in the medical curriculum these considerations are less important. At the medical school at which I trained formal lectures were regarded as an unfortunate concession to contemporary taste, and all that was required was that a student should attend at some time

100 clinical lectures offered between the hours of 1 and 2 as an alternative to lunch. The order in which these lectures were taken was of no consequence; as in the cinema one could go in anywhere. The first instruction I received in obstetrics was a lecture on how to decapitate the foetus. illustrated by an alarming hook. I am sure that a considerable proportion of the audience were vague about the identity of the orifice through which it was to be passed. That such casual arrangements do not empty the lecture theatres is attributable to two things: from the beginning the student is able to fit the ill-assorted material into his conception of the subject as a whole; even if he is uninterested in what he hears, he does not question its relevance to medical education. These are the assumptions which the teacher of social medicine cannot make.

Coherence

It must be admitted that the chief difficulty in presenting a coherent conception of the subject is that teachers themselves are by no means agreed about it. It is true that syllabuses in current use in the western world have many elements in common: epidemiology; medical statistics; the administration of medical services; human genetics; control of infectious diseases; and social complications of illness. Yet when asked to

^{*}The term "social medicine" is used in the sense in which it is employed in the medical schools of Great Britain, and is identified with the term "preventive medicine" as used in the United States.

state in simple language what the subject is about, many teachers find themselves in the same difficulty as their students. It is not disease-prevention, or medical administration, or statistics, or genetics, although it embraces all these subjects. Indeed some people are sceptical about the possibility of finding a word or phrase to convey the scope of social medicine, with the simplicity and accuracy which is possible in anatomy or physiology.

In part the difficulty derives from the origin of the subject. Traditional teaching in public health or preventive medicine provided an account of the work of public health authorities. The nature of this work was not determined by logic, but by urgency and convenience. It comprised those medical services, mainly but not exclusively preventive in character, which had been forced upon the attention of public bodies. So far the scope of the teaching, if somewhat arbitrary, was at least understandable. But it has been greatly extended in recent years by the addition of other responsibilities. For example an attempt has been made to link the instruction more closely with clinical medicine, by consideration of what may be described broadly as the social complications of illness, identified to some extent with the activities of the medical social worker. Because departments of preventive or social medicine have a natural interest in medical statistics and human genetics, medical schools have frequently found it convenient to make them responsible for instruction in these disciplines. Finally, and perhaps of greatest significance, changes in the organization of medicine are rapidly making discussion restricted to the traditional public health services wholly inadequate.

If a coherent syllabus is to be a-

chieved I suggest it will be necessary to make two major changes. The first is exclusion of medical statistics and human genetics; the second is extension of the instruction, hitherto restricted mainly to preventive measures, to include the curative services. Let us examine these proposals more closely.

The reason for omitting medical statistics and human genetics is that they are separate disciplines, and there is no possibility of achieving coherence if they are included. The intimate association between these subjects and social medicine is understandable; but they are almost equally relevant to other parts of the medical curriculum, and to present them as part of social medicine is misleading. This is not to suggest that it is undesirable to make the departments responsible for instruction in medical statistics and human genetics, as in a few schools they are still responsible for bacteriology (or more precisely, a few departments of bacteriology are still responsible for hygiene). But no one would suggest that textbooks of social medicine should include a technical discussion of bacteriology, and the reasons for excluding statistics and genetics seem equally compelling. Moreover there are already in existence good short books dealing with both subjects, and the abbreviated accounts which can be provided in a single chapter are quite unsatisfactory.

The reason for extending the instruction to include the curative services is perhaps less obvious. Until recently, if the teacher had been asked what his subject was about, he would probably have replied that it was concerned with preventive medicine or with public health, by which he meant the work of the public health service. And since this service was focused on the environmental

and personal health services, the instruction virtually excluded consideration of curative medicine.

This arrangement had obvious disadvantages. For one thing it identified the subject with matters which most students regarded as unrelated to their probable future work. But even more important, it separated the preventive services, which were discussed by the public health teacher, from the curative services, which were left to the clinician or more commonly were not discussed at all. This meant that at no point in the curriculum did the student find the problems of medical administration examined in the light of the possibilities and limitations of both prevention and cure. The rapid extension of public medical services in recent years have made omission of the curative services even more incongruous than it was before. In Great Britain today the government finances and administers a complete medical service, and discussion limited to the traditional themes would exclude services which consume about 90 percent of the total expenditure.

The objective

If we agree that the curative as well as the preventive services should be included, what shall we regard as the objective of instruction in social medicine, having in view the desirability of achieving a coherent syllabus? I suggest that it might be as follows: To provide an understanding of the problems confronting us in medicine, and of the means at our disposal for solving them.

The first reaction to such a proposal is likely to be that it is far too ambitious. Can any single department undertake to discuss all the problems which confront us in medicine—problems of research, of practice and of

ethics as well as of administration? The statement evidently requires clarification.

It is widely recognized that medical training has become fragmented, largely because teachers are individually responsible for only a small part of the curriculum. Under such circumstances it is difficult to achieve balance, and virtually impossible to present a coherent view of what medicine is really about. It could not be claimed that at qualification, or indeed after, most doctors have any clear ideas about what medicine has achieved in the past, what it can do at present, and what it may hope to do in the future. And no serious attempt is made to remedy these deficiencies. This is the task which, it is suggested, departments of social medicine might undertake, and they might approach it by considering such matters as the following:

- 1. What has been achieved in respect of health in the past, and to what is the achievement due?
- 2. What circumstances have determined the present form of the medical and related social services?
- 3. What is the nature of the problems now confronting us in medicine? Which are the most important diseases, and how is their incidence affected by age, sex, social circumstances, geography and other variables?
- 4. How do the medical services work in practice?
- 5. What measures are available for the prevention of disease (chiefly control of inheritance and of environment) and what do they cost?
- 6. What measures are available for the cure of disease, and what do they cost?

The extent to which such objectives differ from those which are traditional in preventive medicine may be illustrated by reference to a specific disease. Discussion of rheumatic fever on conventional lines might well include its etiology, incidence, distribution, methods of prevention and, recently, the social complications to which it may give rise. It would be very unlikely to include consideration of the cost and effectiveness of methods of treatment in current use: for example a general assessment of results of operative interference with the mitral valve in rheumatic heart disease. Yet without this discussion it is not possible to give a balanced view of the problem of rheumatic fever: the present status of knowledge of its etiology; the relative contribution of prevention and cure to its control; and the direction in which we must look for further advance. To the possible objection that, however desirable integrated instruction of this kind may be, teachers of preventive or social medicine are not as a rule sufficiently acquainted with the results of therapy to undertake such an assessment, two answers may be given. In the first place there is no reason why instruction should not be undertaken jointly with clinical teachers. And secondly, if the objective suggested above is accepted, it is evidently highly desirable that teachers of social medicine should familiarize themselves with the possibilities and limitations of treatment, as they are now familiar with the possibilities and limitations of prevention. It is not necessary to be an engineer to assess the cost and results of purification of water, and one need not be a thoracic surgeon to evaluate the contribution of operative interference in rheumatic heart disease.

Let us now try to sum up. If it is agreed to jettison medical statistics and human genetics, and to include the curative services, the task of achieving a coherent syllabus is greatly simplified. It is suggested that instruction in social medicine might attempt to provide an understanding of the problems confronting us in medicine, and of the means at our disposal for solving them. The teacher should be identified, not as the individual responsible for medical administration, or for prevention of disease, or for statistical methods in medicine, or for the humane approach to clinical medicine, but as one whose business it is to present a broad and critical view of medical affairs. His main task is to help to train a generation of students who know what medicine has done and can (and cannot) do, and who as a result of this knowledge may contribute intelligently to its future development. For this purpose it will be necessary to evaluate medical achievement in the past, to examine the disease problems which confront us today, and to assess the effectiveness and cost of the preventive and curative procedures now in use.

Presentation

It was suggested that a second requirement in a satisfactory syllabus is attractiveness of presentation. Inspection of the subjects proposed for inclusion in a coherent scheme will suggest that some of them can be expected to interest a medical student almost from the beginning, whereas others certainly will not. With subjects which are unlikely to be of interest two procedures can be adopted; they can be pruned of all matter which cannot be regarded as essential and they can be presented in such an order that their relevance to medicine becomes apparent. Let us consider first the question of content.

It was suggested that measures used to prevent disease include both inherited and environmental influences; among significant environmental influences are housing, atmospheric pollution and food control. These are not subjects which medical students regard as within their province, and it seems important not merely that their inclusion should be justified, but that no more should be taught than is necessary.

It is not difficult to justify some discussion of housing. The decline of mortality during the past hundred years is attributable chiefly to improvements in the environment, and since advances in housing standards have been among the major environmental changes, it seems reasonable to require a medical student to know something of the present status of knowledge of housing and health, inconclusive as this knowledge is. It is quite unnecessary to ask him to concern himself with criteria of slum property or with the measures by which houses are made habitable. Similarly the influence of the atmosphere on health is an important matter about which it is desirable that medical opinion should be well informed, but this is scarcely a reason for discussing the means by which air pollution is prevented. And while it is worthwhile for students to know the diseases spread by milk, consideration of the technique of pasteurization is quite outside the scope of undergraduate requirements or interest. Yet all these subjects-house construction, control of atmospheric pollution and methods of pasteurization are commonly taught, and knowledge of them may be expected in qualifying examinations.

The question of subject order also deserves close scrutiny. However severe the pruning, some topics will undoubtedly remain which are not, unless they are prepared for, to the taste of medical students. Unlike students of the social sciences they are somewhat intolerant of discussion of such matters as medical-social history, the social services and the organization of central and local government, unless these subjects can be shown to have some direct relation to traditional medical interests.

Such a demonstration should not be beyond the ingenuity of the teacher, but it requires careful consideration of subject order. For example, an account of social services related to medicine can be made of interest to most medical students if it is preceded by consideration of the significance of the environment in relation to health. Once it is recognized (a) that the improvement in health today as compared with 150 years ago is due mainly, not to what happens when we are ill, but to the fact that we do not become ill, and (b) that in general we do not become ill, not because of specific procedures such as vaccination and immunization, but because we live in a healthier environment, the nature of the services which contribute to the standards of the environment becomes a matter of direct medical interest. Broadly it is probably true to say that if a subject can be related to the common ground of medical interest it can be counted on to hold the attention of medical students. If it cannot be so related it should not be in the syllabus.

La preparación de un compendio de Medicina Social

La Medicina Social no está aun bien integrada en el sistema de la Educación Médica tradicional. No se puede esperar, por otra parte, que los estudiantes, cuando inician su estudio, tengan un concepto claro y coherente de esa materia, y esto produce, por lo general, la idea de que se trata de una asignatura poco necesaria para ellos. Un buen compendio de Medicina Social debe, ante todo, ayudar a los estudiantes a formar un concepto coherente de lo que "Medicina Social" significa, y, al mismo tiempo, debe despertar interés hacia ella. El autor del presente trabajo, Profesor del Departamento de Medicina Social de

la Univ. de Birmingham (Inglaterra), discute las dificultades inherentes a la preparación de tal compendio y presenta sugerencias en cuanto a su contenido, así como en cuanto a los obietivos principales que la enseñanza de la Medicina Social debe alcanzar. Haciendo abstracción de la situación particular preva-lente en Inglaterra, donde el Gobierno ad-ministra un servicio médico completo para toda la población, el autor sugiere como principales los siguientes objetivos: comprensión de los problemas con los que se enfrenta hoy la profesión médica, y conocimiento de los medios para resolver éstos que se hallan a nuestra disposición, incluyéndose tanto los servicios curativos como los preventivos. La tarea de preparar dicho compendio incumbe a los Departamentos de Medicina Social, los cuales, se sugiere, podrían abordarla ocupándose de estos temas generales: ¿Cuáles son los avances de la Medicina Social con respecto al pasado? ¿Cuáles son y a qué se deben las circunstancias que determinaron la forma presente de nuestros servicios médicos y sociales? ¿Cuál es la naturaleza de los problemas con que la Medicina se enfrente en el presente? ¿Cuáles son las enfermedades más frecuentes, y de qué modo queda afectada su incidencia por la edad, sexo, condiciones sociales, geográficas, etc.? ¿Cómo funcionan en la práctica los servicios médicos? ¿Cuáles son las medidas disponibles para la prevención de las enfermedades y cuál es su coste? ¿Cuáles son las medidas disponibles para la curación de las enfermedades y cuál es su coste? Para preparar ese compendio en forma atrayente y que despierte el interés de los estudiantes, el autor sugiere que algunas materias, las que parezcan menos interesantes, sean reducidas a lo esencial, y que sean presentadas en orden tal que se destaque claramente su importancia para la Medicina en general.

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un minimum de 25 lectores.

An Error

In the January issue of the Journal, on page 48, in "The Future Need for Physicians," a statement adopted by the Association of American Medical Colleges in Annual Session, November 13, 1956, the following sentence appeared: "In the 10-year period since the end of World War II, the number of medical schools has increased from 77 to 82, the number of entering freshmen from 6,060 to 7,686, and the number of graduates from 5,655 to 6,485." The last figure should have read to 6,845.

A Consideration of Preceptorial Medical Education in the United States

WALTER S. WIGGINS

NIETZSCHE has written that "A strong and well constituted man digests his experiences (deeds and misdeeds all included) just as he digests his meats, even when he has some tough morsels to swallow."

This conference represents an opportunity to follow that sound advice.

According to Webster, a precept is a "commandment, mandate, instruction or order intended as a rule of action or conduct." Having established an aura of dogmatism, Mr. Webster then relates that in medicine, a preceptor is a practicing physician who takes an undergraduate medical student as an assistant and gives him personal training in the practice of medicine. By joining these thoughts, one would logically conclude that a preceptor gives training in medical practice by precept, i.e, by order, commandment or rule. Surely if this truly expressed the nature of a preceptorship in medicine, any conference today on the subject would be attractive only to pathologists with an interest in the autopsy findings of a completely morbid educational system. When Dr. Bardeen established the preceptorship at this institution in 1925, he acquired for the term a special meaning in medicine now given particular notice in Webster's Dictionary-an accomplishment that few achieve. It seems probable that Dr. Bardeen's selection of a title was

derived from the preceptorial system instituted at Princeton by Woodrow Wilson in 1905 for individualizing college instruction by student conferences with and special work done under preceptors.

It is of interest to note that Dr. William Kerr, professor of medicine at the University of California, introduced in 1926 at that institution the principle of allowing interested senior medical students to spend four to six weeks with carefully selected general practitioners in rural areas.²

Since earliest times

The fundamental relationship of intimacy between practitioner-teacher and student in today's preceptorial system has existed in apprenticeship education in medicine since the earliest times of the priest physicians, reminding us that there is little new except that which has been forgotten. One of the basic thoughts of the Hippocratic Oath deals with the personal flavor of the physicianpupil relationship. Throughout the Greek and Roman periods the apprenticeship system persisted long after the establishment of medical schools with formal course work.

At the time of the beginning formation of our own country, there ex-

¹Genealogy of Morals. Second Essay.

²Sweet, Norman J. and Kerr, Wm. J.: Further Report on the Preceptor System in Medical Education, J. Med. Educ., 26:208-210, May 1951.

isted excellent medical schools in Britain and Europe. Coexistent with these schools, however, was the apprenticeship system and it, with all its advantages and disadvantages, was transplanted to America. Under this system, there were wide swings in the quality of training received by the student of medicine indentured to his physician teacher. The education of the apprentice was subservient to but none the less a part of the care of the patient. Fortunate indeed was the young man associated with a physician gifted both as a clinician and teacher, for such a private tutorial approach under circumstances as existed in that era could have been ideal. Beside teaching, informal small group discussion following or preceded by observation and practical application-so much of what we consider today as components of good teaching practice-were all potentially present in that system. However, the potential was directly related to the ability of the physician as clinician and teacher.

The activities of Dr. Shippen, Dr. Morgan and Dr. Bond which led to the development in Philadelphia of the first medical school in this country just before the onset of the Revolutionary War are well known. By 1800 medical schools were also established at King's College (Columbia University), Harvard and Dartmouth. These were all developed on sound principles and the preceptorial or apprenticeship system was incorporated as a part of the over-all educational process. Initially these medical schools were intended to supplement the apprenticeship but gradually they supplanted it. With the formation of increasing numbers of proprietary schools with educational programs consisting almost entirely of didactic exercises, medical education became divorced from the care of patients.

Thus, up to the present century, the preceptorial system, though under the title of apprenticeship, persisted throughout the recorded history of medical education. Its role varied considerably and perhaps it came nearest to extinction during the latter half of the 19th century. The loss or near loss of the preceptorial method at a time coincident with the enthronement of didacticism was particularly unfortunate. There existed no significant compensation or substitute for the disappearance of patient-centered instruction and associated real life experience; students now universally were assigned passive rather than active roles in their education; there was no longer possible an intimate teacher-student relationship with its accompanying easy intercommunication and the opportunity to observe and hopefully acquire those qualities of compassion and selfless devotion to the sick which are so essential but which can be taught only by example and not by precept.

Turn of the century

Beginning at the turn of this century, sincere efforts by sincere people highlighted by the famed Bulletin No. Four of Dr. Flexner² and with Johns Hopkins established as a pattern led to the development in the United States of medical education as a true university function. Obviously this was not rapidly accomplished, and possibly in some institutions has not as yet advanced to the point of full accomplishment. In the old world, medicine had long been considered one of the learned pro-

³FLEXNER, ABRAHAM: Medical Education in the United States and Canada. D. B. Updike, The Merrymount Press, Boston 1910.

fessions, properly in the university domain. This development in the United States reflected a delayed acknowledgment that medicine grew seriouly ill while living away from its ancestral home.

During that period when proprietary schools held sway and medical teaching was largely separated from the care of patients, the preceptorial or apprenticeship system would have had the leavening influence of centering clinical teaching about patient care. Indeed, in retrospect it might be declared that the most noteworthy objective of preceptorships as they existed in the past was to provide a form of bedside instruction. The major, but by no means consistently present, value of the old preceptorial system were those incidental to the opportunity provided for an intimate and personal interrelationship between student, patient and practitioner. The learning and teaching of medicine was the direct goal.

No significant return

It is significant to note that there was no return of the preceptorship parallel with the development of our current system of medical education. There were only 24 schools offering preceptorships in the academic year 1954-1955, and only in four, Wisconsin, California, Vermont and Duke were they in existence prior to the Second World War.⁴ Four other programs came into being after the war and before 1950. The remainder have been instituted since 1950.

The changes that took place in medical education beginning early in the century brought within the confines of the educational arena patients and teachers. The objectives and values of the preceptorship as it had previously existed could now be met intramurally with considerably more assurance as to a uniformly higher level of instruction.

Since the academic year 1948-1949, the Council on Medical Education and Hospitals has annually solicited information from medical schools regarding preceptorship programs. In 1948, there were nine such programs, in 1949-13, in 1950-19, in 1951-25, in 1952-21, in 1953-22, in 1954-24. In each of these years, more than half of the programs have been offered on an elective basis. During this seven year period, five schools have withdrawn their programs with no stated intention of reinstating them, Three other programs have been dropped and subsequently reactivated.

When viewed on a nationwide basis, it becomes evident that although there has been a partial revival of the preceptorial system, there is not yet sufficient evidence to indicate that this partial revival will be lasting, much less that it will become complete.

Why "small revival" occurred

It seems of some pertinence to speculate as to why this revival, even though partial and with an as yet unsecured future, occurred.

The remarkable reform in medical education that accompanied its university orientation was associated with tremendous efforts and productivity in research made possible by the academic setting of the medical schools. For many years, there was very little concern expressed over the almost complete preoccupation of our faculties with the scientific pursuit of the cause, mechanism and cure of organic disease. The accomplishments that resulted from this pre-

^{*}Turner, E. L., Wiggins, W. S., and Tipner, Anne: "Medical Education in the United States and Canada," J.A.M.A. 159:563-606, Oct. 8, 1955.

occupation were so magnificent as to almost preclude criticism. This can be readily understood when one realizes that during this "Golden Age of American Medicine" life expectancy was increased by one-third, representing an accomplishment in part of one century greater than that achieved during the preceding 2,000 years.

The ever expanding store of knowledge and increasing thirst for more knowledge in all fields of endeavor inevitably led to individuals concentrating their efforts into restricted fields and the development of specialists. In medicine, specialization produced broad changes in the total structure of medical practice. The general practice of medicine, as a way of life for physicians and as a method for receiving health care for the public has been particularly affected, and indeed its very existence, some believe, is threatened.

By the very nature of things, the faculties of our medical schools became the first segment of the profession to become specialized. Before long this became a complete process so that medical students during their most formative years were exposed only to teachers who were themselves specialists in medicine.

"Urge for happiness" too

During the same period in which the great strides were made in biological and physical sciences that had such a beneficial impact on organic diseases, significant but less well heralded advances were also taking place in the social and behavioral sciences. There was an accompanying general public awakening of social consciousness and urge for happiness which Homer Smith has characterized⁵ as that state (to him unattainable) requiring optimal integration

between the organism and its environment. It became recognized that medicine had not performed satisfactorily even though it cured a patient of a serious disease, if that patient could not return to fruitful living because of personal problems related to his family, his work or any other part of the total environment in which he lived. This served to highlight the necessity of considering each patient as a whole person rather than as the vehicle of an interesting disease entity. The responsibility of the profession to the patients it serves under this concept is to render "comprehensive" medical care and thereby to bring about "optimal integration" of the human organism and its environment.

These issues were dealt with rather clearly in a report of the Commonwealth Fund⁶ which said in part: "Medical education may now be in the second of three phases of adjustment. The first . . . has had scientific medicine as its objective and slogan, specialization as its dominant pattern, and the university medical center as its preferred instrument. The second now unfolding, is a phase of transition in which the concept of comprehensive medicine is beginning to modify the definition of scientific medicine, in which there is some reaction against the extremes of specialization, and in which a few medical centers are beginning to reexamine their functions and achievements. . . . It is reasonable to hope that it will be followed by a third phase in which there will be some

⁵SMITH, HOMER W.: Objectives and Objectivity in Science in the Report of the Proceedings of the Inter-Professions Conference on Education for Professional Responsibility, The Carnegie Press 1948.

⁶Annual Report, The Commonwealth Fund, 1952, 1 E. 67th Street, New York.

reconciliation between what has been called scientific medicine and what is now called comprehensive medicine . . . and some restructuring of both medical education and medical care to fit the needs of a more knowledgeable social order . . . Scientific medicine . . . based upon the fullest and most exact knowledge of the patient that is available . . . has hitherto been weakest in relation to the patient's affective life and his social environment. The behavioral sciences are already helping the doctor to rely less on intuition and more on systematized knowledge as he approaches these facets of the patient. Not to make use of them so far as they are usable would seem to be unscientific."

Thus, medical education has in relatively recent years been concerned with this need for emphasis in teaching of the behavioral sciences and social and environmental factors in health and disease. In addition, the changing structure of medical practice and care as a result of specialization has brought about a serious concern. Some institutions have a conviction that it is within the proper province of a medical school to attempt to influence this change.

Stated objectives

It is of peculiar interest to inspect the stated objectives of the preceptorship programs in effect last year⁷ in light of these recent concerns. In 19 of the 24 programs in existence, the preceptor is always or almost always a general practitioner. In a similar number of instances, a major objective of the programs is to acquaint students with general practice as a way of life. Associated comments express an interest in students having an opportunity to observe patients in their natural environment, care of the "whole" patient and the working ethics and economics of medical practice. It is pertinent to note that in only two instances was it indicated that the preceptorship was expected to contribute to the students' fundamental knowledge in medicine. In one of these, a two year school of basic medical sciences, the preceptorship was designed to augment instruction in physical diagnosis.

Overcome exclusion from GP's

It therefore seems probable that preceptorship programs were revived largely to overcome the exclusion of medical students from the influence of general practitioners and to acquaint them with the nature, problems and satisfaction of such a career. An associated motivation of this revival in some schools was to have this experience stress the role of social and environmental factors in medicine.

Mention should be made that these needs have stimulated methods of fulfillment other than the preceptorial system. Comprehensive Care Clinics and a variety of home care programs have been brought into the curriculum particularly in response to the desire for increased emphasis in instruction in ecological medicine. In several of these, general practitioners have been given responsible teaching assignments and in a few instances have total responsibility for the program.

The future?

With this exploration of the medical preceptorship in its historical perspective and its partial revival in modified form as a response to an

⁷Communications from Medical Schools to Council on Medical Education and Hospitals.

educational need as a background, thought should be given to considerations that appear likely to be of importance in determining the future of the preceptorship in medical education.

Certainly all of us are of a similar conviction that the continued success of our medical schools can be assured only if they remain as an integral part of the over-all university activity. This status can be maintained only if medical schools abide by university standards and wear willingly the mantle of university attitudes. The preceptorship, then, must be capable of measurement in university terms and found not wanting if it is to persist. What are the characteristics of a university pertinent to this consideration?

As a congregation of scholars, the university must embody the highest ideals of scholarship. Inherent in a scholarly community are two, or perhaps actually three, major functions. Through that inborn urge of pure curiosity possessed by all scholars, it must explore the whole of nature and thus create knowledge. It must communicate available knowledge. The third function of perpetuating future scholars is hesitantly qualified only because this activity will inevitably occur so long as young, curious minds are exposed to the other two functions. Dr. James R. Angell, former president of Yale, characterized the university as responsible for laying "the scholarly foundation for the great professions of medicine, law and theology."8 He goes on to state that "The university must . . . be particularly sensitive to those requirements of a given era which are especially urgent . . . On the other hand, the universities cannot become mere weathervanes, whipped about by every breeze of circumstance, and it is of the essence . . . to discern and reject the superficial and the ephemeral and to fasten their attention upon the more enduring and the momentous."8

Since the preceptorship is so intimately concerned with the teaching function, insight into the characteristics of university teaching is important in this measurement. Dr. W. Melville Arnott, professor of medicine at the University of Birminghas, has said of such teaching that "The emphasis is not on instruction in the sense of didactic teaching, nor does the student go to the university so much to be taught as to be helped to understand; to acquire outlooks and habits of scholarship; to develop his critical faculties to the utmost; and above all, to be fired with curiosity to know, to find out and to add to the total of human knowledge."9

Can the objectives and methods of present preceptorship programs meet university standards? In so far as such programs are designed to demonstrate sound principles that will serve a student as guides in his own future professional life, there can be no conflict with these academic concepts. The observation of medical practice as a way of life under proper circumstances can certainly be a valuable educational experience. This experience, however, to justify the existence of a preceptorship as a university activity, must be concerned with fundamental principles particularly in regard to such matters as are

⁸ANGELL, JAMES R.: The University Today: Its Aims and Province in The Obligation of Universities to the Social Order, New York University Press, 1933.

⁹ARNOTT, W. MELVILLE: "The Aims of The Medical Curriculum in the Proceedings of the First World Conference on Medical Education," Oxford University Press, 1953.

important to the physician and his patients in their interrelationships in medical practice and community living. The principles of concern to a preceptorship program should be restricted to those that cannot be adequately presented within the medical center.

Creation of a preceptorship program to compensate for unsatisfactory outpatient clinic organization and staffing, or undesirable faculty attitudes represents only expediency. That such expediency has played a role seems evident from statements published regarding certain existing programs. Surely it should not be necessary in a proper medical school to have a preceptorship program in order "to help the student grasp . . . the need for understanding each patient as a person with a family, job and other sources of trouble . . .," "to demonstrate the advantages of early application of treatment," "to provide a personal advisor to the student," and "to acquaint the student with the handling of patients."

An interest as part of university education in acquainting students with the economics of medical practice through preceptorial training if given the importance indicated reflects a confusion of vocational training with professional education.

Current preceptor programs vary in duration from two weeks to four and a half months with a mean of five to six weeks. Presumably the duration is largely determined by the objectives of the program. If objectives were confined to those consonant with true education and available only through preceptorships, could such an activity be justly given as much time as is true in the longer programs? In each instance, have the values of time away from school been weighed against the values of similar time spent within the schools?

Teaching and teachers

As an integral part of the over-all measurement, consideration must be given to methods of teaching and qualifications of the teachers. Is the medical school satisfied that the preceptorship places emphasis on the student acquiring habits of study and the development of the student's critical faculties?

Whether preceptors have faculty appointments is of little importance since in every instance they are fulfilling faculty responsibilities. Are preceptors chosen on the same basis of scholarly attitudes and teaching ability as other members of the faculty? Do all preceptors have ready recourse to adequate library facilities and do students and preceptors alike commonly use these facilities? Preceptors very properly have as their primary responsibility the welfare of their patients. Although this need not interfere significantly with their potential values as teachers, and in fact can represent an important segment of the way of life for the student to observe, the school should take this into account when structuring the responsibilities of preceptors.

The most important feature in determining the success in terms of objectives set forth of any preceptorship is the ability and interest of the preceptor. These qualities at best are very difficult to measure. This difficulty has apparently not stimulated very vigorous efforts on the part of the medical schools to find acceptable means of evaluation. In all but six programs, continuing evaluation is based solely on written or verbal reports from preceptors and students. In the six instances, a member of the faculty briefly visits the preceptor, but generally not more than once a year. Occasional annual conferences with preceptors are held at the medical school.

If time allowed, it would perhaps be of value to pursue the preceptorial system further as related to today's objectives of medical education and a consideration of its potentialities in the years after medical school is completed.

It is to be noted that these statements represent the thoughts of an individual who has not had direct experience with the preceptorial system and therefore are readily susceptible to the charge of lack of full knowledge. It does seem probable, however, that if the preceptorship is to have any lasting role in medical education, it is of primary importance that its objectives be clearly defined. The definition should encompass only matters in keeping with medical education's university orientation and confine preceptorships to activities that are not adequately available within the medical center. Preceptors should be chosen who are in complete sympathy with such objectives and competent to fulfill them.

Algunas consideraciones sobre el Preceptorado en la Educación Médica

Según la definición de Webster, un preceptor, en Medicina, es un médico practicante que toma como asistente a un estudiante de Medicina para entrenarle en la práctica de la profesión. Este sistema de aprendizaje médico, cuyo origen se remonta a tiempos muy antiguos,, coexistió, en Inglaterra y otros países de Europa, con los Colegios de Medicina, y fué adoptado en los Estados Unidos, junto con el sistema europeo general de Educación Médica, cuando este país se convirtió en nación independiente. El auge de la "Medicina científica" y de la especialización, trajo consigo la decadencia del Preceptorado, y sólo en tiempos muy recientes se ha presenciado un renacimiento de esa institución. El Dr. W. S. Wiggins, Secretario Asociado del Consejo de Educación Médica de la American Medical Association pasa revista, en este trabajo, a la evolución del Preceptorado en los Estados Unidos desde los principios de la Educación Médica hasta el presente. Aunque destaca el hecho de que el resurgimiento reciente de los preceptores es solamente parcial, y que no hay nada indique ha de llegar en el futuro cercano a un completo auge, lo considera, sin embargo, un fenómeno interesante. La causa de ese renacimiento se encuentra, según el autor, en la reacción contra la especialización y la Medicina "científica" que se observa hoy en muchos centros universitarios, así como en el nuevo concepto de Medicina "comprensiva" a que esa reacción dió lugar. Los programas de aprendizaje con preceptores que han sido introducidos recientemente en el curriculum de algunas Escuelas de Medicina, parecen tener por objeto, generalmente, no tanto que el estudiante adquiera más conocimientos médicos sino someter a éste, por algún tiempo, a la influencia de un médico de práctica general, y poner énfasis en los factores sociales y de medio ambiente en la Medicina, familiarizándole con los problemas, dificultades y satisfacciones de la práctica general. El Dr. Wiggins discute las relaciones que el Preceptorado tiene con la enseñanza universitaria, y destaca la necesidad de mantener los programas de aprendizaje a un nivel que corresponda al de la educación médica universitaria. Para lograr este objetivo, una selección cuidadosa de los preceptores es de importancia primordial,

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un minimum de 25 lectores.

The Training of Psychiatric Residents in Consultative Skills

ROBERT H. BARNES, EWALD W. BUSSE AND BERNARD BRESSLER

UR CURRENT society and institutions are presently changing at an unprecedented rate, and near the core of this change is medicine-both the "art" and practice of medicine, and the more technical aspects of experimentation and research. Probably no medical specialty is more caught up in this and more concerned with defining and establishing its day-to-day roles than psychiatry. Fortunately or unfortunately we are an important bridge between the broader social institutions of our age and the more restricted basic and applied biological sciences. Thus we are often called upon to advise welfare, educational, governmental, business and industrial organizations when problems and policies relating to human feelings and emotions are involved. We are also called upon to communicate our knowledge of child and adolescent behavior to parentteachers associations and church groups, not to mention Rotarians and Lions. More and more we are expected to pass along useful observations about patients to nonpsychiatric physicians who have sent these patients to us, not so much for diagnosis and disposition, as for therapeutic and management suggestions which they, in turn, hope to carry out.

The psychiatric specialist is being asked to step out of the consulting

room and the hospital ward and to give of his knowledge to a progressively larger array of the eager, the curious, the anxious, the hostile and the accepting, both lay and professional. In these situations the best prepared and most publicly verbal of us frequently quake and are filled with doubt, and feel acutely aware of the lag between what we believe to be true and what we can communicate to others. And the least prepared of us retreat in panic to the sanctity of our offices to curse in quiet the memory of those who have "oversold" psychiatry to the consuming public. Whether the specialty has or has not been "oversold" by its protagonists is beside the point. The demands are there, and few can question the need for the dissemination of psychiatry's relatively more accurate and useful knowledge concerning human behavior and motiva-

We wish to present an outline of a currently functioning program which brings the psychiatric trainee face to face with these consultative problems and allows him, under supervision, to develop the skills and techniques which will give him confidence and security when he meets face to face with an inquiring public. The phrase, "under supervision," should be underlined. Just as the training of psychiatrists in psychotherapy is achieved

satisfactorily only with intensive, individual supervision, so the training in consultative skills cannot be adequate without the close guidance, support and constructive criticism of senior supervisors.

To prepare a resident physician for this type of activity may seem beyond the scope of a three-year residency training program in psychiatry. The amount of basic and clinical material which the welltrained psychiatric resident should master grows year by year, and it may seem as though including special training in "consultative skills" will only serve to dilute a training program further. In our experience this has not been so. Actually such training has not only given added clinical experience, but it often has necessitated the resident clarifying for himself some of his basic concepts of psychopathology.

RESIDENCY PROGRAM

First year:

At this beginning stage of the resident's development no consultation work per se is done. However, training in communication skills which forms the basis for future consultative work begins almost immediately. Junior medical students, during their clerkships on the in-patient psychiatric service, are individually assigned to a first year resident. He supervises their contacts with their assigned patients, checks their histories, mental status evaluations and the like. He counsels with the student concerning the latter's findings, thoughts and feelings about the cases he sees. Each first-year resident spends five to six hours per week in such contacts with the junior students. The more formal instruction of the junior students is done by the

senior staff, who are also available to help the first-year residents in their contacts with the junior clerks. In addition, selected first and second year residents participate as instructors in more formal small-group teaching of interviewing techniques to the sophomore medical students. These teaching contacts have worked out well both from the residents' and students' standpoint, and have given the residents very early an opportunity to learn the problems and techniques of communicating information concerning feelings and emotions to non-psychiatric personnel.

In addition, the first year resident has an opportunity to learn communication problems with student nurses and attendants through courses he conducts with them in descriptive psychiatry and ward management, including some applications of dynamic principles, Incidental teaching by residents is an almost continual process. This takes place with the nurses at all times when the nurses wish advice on a particular way of interacting with a patient. In addition, each patient who is assigned to a resident is also assigned to one of the student nurses, and they together formulate the ward management of the patient.

Second year:

During this year the resident spends at least six months on what we refer to as the psychosomatic service. Essentially this is a consulting service which is called on by almost all the other services in the hospital for help in diagnosis, management and disposition. The patients are those with psychiatric disorders of the usual sort, as well as the type of cases we usually list as psychophysiological disturbances (eg. peptic ulcer, asthma, rheumatoid arthri-

tis, ulcerative colitis, etc.). These patients may or may not have concommitant organic disease. One factor which has certain advantages is that these patients are not directly under the care of the psychiatric department, which has no psychosomatic beds. Thus these patients are primarily managed by the referring service. Whatever the drawbacks of this arrangement, it does serve a very real advantage in terms of the resident consulting and learning to work closely with non-psychiatric personnel. In his function as a consultant the resident must learn all the auxiliary techniques essential to a good consultation in private practice. The resident has to learn how important it is to establish good working relationships as well as mutual understanding between himself and the other services. Without this any cooperative treatment program is doomed to failure.

Since the patient is on another hospital service, a frequent complication is that once a diagnosis has been established and the therapeutic program outlined, a patient is as rapidly as possible dismissed from the hospital. This is obviously not always ideal from the psychiatric standpoint, but is made necessary by such factors as the high cost of hospitalization, etc. However, the resident soon learns that one of his primary skills is to obtain the most thorough evaluation of the patient in the briefest time, as well as to institute a treatment program, if indicated, with as little delay as possible. Thus a resident must learn how to evaluate dynamically a patient's problems, not only in terms of the unconscious psychodynamic meaning of the symptoms but also what might be termed "sore-thurzb" material, i.e., the function of his disease and symptoms in his immediate, everyday setting. Residents thus must be intensively and thoroughly inculcated in how to evaluate presenting complaints, symptoms and the total picture in general. One very useful adjunct has been to give the resident some insight as rapidly as possible into the meaning of dreams, largely as a guidepost to the meaning of illness to the patient. This, however, does not mean to imply that the residents become experts in dream analysis or necessarily use these dreams in their therapeutic working with the patient.

This leads to the question of how to write a consultation note. We believe that instruction in this art is of tremendous importance and often entirely neglected in the residency training. The resident is taught the value of a good consultation note and the following instructions are given to the resident in our PSYCHOSO-MATIC MANUAL: "Consultation notes should be comprehensive but should avoid excessive verbosity. The more succinct, the easier to read. Although it may seem trite to mention, try and make your notes legible; otherwise they will often not be understood. Avoid generalities, especially in recommendations. The more specific you are and the better you spell it out, the more likely it will be comprehended. It is best not to fill notes with psychiatric terms as they may not be understood. If you can translate into terms which might be more easily recognized, the note will be more effective. Don't say, for example, 'The patient has evidence of marked Oedipal difficulties.' but clarify the situation in some such manner as 'The patient has difficulty with hostile feelings toward his father, and an extremely close relationship with his mother and is constantly attempting to take over his father's role in relation to his mother.' "

The resident is shown that inter-

viewing a patient and leaving a referral note is not sufficient. The resident is expected to seek out the student, the intern, the resident or senior staff physician under whose care the patient is and review the case with him in order to understand the total situation, carefully explaining his plan as to management and disposition. Such a discussion frequently includes, eventually, nurses, physiotherapists, social workers, not only to obtain their ideas and observations on the patient but to help them in terms of their feelings toward the patient and to implement any therapeutic regime. The resident learns that there is no substitute for personal communication with the ancillary personnel. Simply leaving a note is frequently of no avail.

As often as feasible the resident is encouraged to make ward rounds with the house staff and attending men on the other services, more particularly on medicine. Not only does the resident learn about the medical problems involved in the patients that he sees, but he finds that it helps his relationship with both house staff and ward personnel. The resident then learns that as his relationship with the house staff improves many requests for advice will be forthcoming, frequently even without an official consultation. Such contacts are not discouraged but rather are treated thoughtfully because of the value of maintaining a friendly interpersonal relationship between the consulting service and psychosomatic service in the total management of emotionally ill patients.

The resident learns, in addition, how to deal with some of the practical and often uncomfortable realities of consultation work. Thus he learns of, and hopefully how to deal with, the varying attitudes of referring physicians. He learns that doc-

tors refer not only for the good of the patient, but also because they wish to rid themselves of a problem case, because they are angry or threatened with the patient or because they think it is the thing to do. For example, in a recent situation, after seeing the patient, one of us called the referring physician and explained the situation. He immediately snapped back, "I'll discharge him from the hospital immediately. Maybe you can keep him from showing up in my office without an appointment and just get him off my neck." Obviously it requires experience to turn such a referral into a helpful experience for the patient. The resident finds himself learning to deal with the patient and physician in a situation where the referral has been forced by the patient against the referring doctor's own desires. He finds out how to deal with the physician who is fearful of losing a patient or who sees a threat to his therapeutic omnipotence in the psychiatric referral. Again to be able to help the patient and still maintain reasonable rapport with the referring service requires the stability and insight that can only come with training and experience. It is this type of experience that we attempt to make available on the psychosomatic service.

Much more might be said concerning the psychiatric resident's relationship with ancillary personnel on the nonpsychiatric ward and the over-all problems of ward management in such situations. However, any further summary of the teaching program on the psychosomatic service would seem out of place in a paper of this sort. At this point one further experience in the gaining of communicative skills should be mentioned. Particularly beginning in the second year, residents are encouraged to attend the various scientific meet-

ings and prepare reports for publication in scientific journals. While this is not strictly a consultative activity, it nonetheless encourages the type of communicative skill that is part and parcel of a good consultation.

The second year resident further participates in a joint conference of the department of medicine and the department of psychiatry aimed toward the training of medical residents in the management of cases with emotional problems who are not referred for psychiatric management, This conference is conducted weekly by the medical service with a senior psychiatrist and a psychiatric resident in attendance. It is a small conference so that the medical residents will feel comfortable in presenting cases. In this conference the psychiatric resident learns more of the problems that the general practitioner and internist face in dealing with emotionally disturbed individuals. He learns the extent to which these non-psychiatric physicians can deal with such problems. In addition, he discovers techniques for counselling with them and learns what consultation and advice he can give realistically so that the patient may be handled without psychiatric treatment. It is often a revelation to the psychiatric resident to realize that other physicians are often capable of considerable understanding and effectiveness in dealing with the emotionally ill.

Third year:

The residents accompany, singularly and at weekly intervals for one to two months, one of the senior psychiatrists in his consultation work with a local welfare department. This is organized at the level of the State Welfare Department but the individual consultations are with various

local departments who visit the central office in accordance with a special consultation program. The usual consultation involves the superintendent and/or supervisor of the local department with one or more case workers as well as one to three of the State Welfare Department personnel. The consultations are two hours in length and are directed by the senior consulting psychiatrist. The resident is encouraged to participate to the extent of his training and personal comfort in the situation. There are many problems in this type of consultation which have been dealt with elsewhere by Coleman² and others. Essentially, however, local agencies bring in one or two cases per consultation in which emotional problems of the clients play an important role in management. An attempt is made to help the worker understand the emotional factors within the client and within herself, so that she can more adequately deal with them at a casework level. While this is not the only type of consultative service that a psychiatrist may be asked to render to a welfare agency, the type of problems encountered and the techniques utilized in dealing with this sort of casework group should equip the resident with techniques to enable him to cope with other types of welfare consultation services as well.

We have no regular program in which the third year resident gains experience with consultative services to schools, but it is hoped that this can be developed. During his six month period in the Child Guidance Clinic he does have an opportunity to participate in informal consultations between the schools and the clinic dealing with the behavior problems of children in which a school is involved.

While speaking to public groups such as parent-teachers association,

church and civic groups is not consultation in the strict sense, it does involve the same type of communicative skill. We currently have our third year resident staff, and to a lesser extent the second year group, available in rotation to render such speaking services in the community. This is set up on a "speakers' bureau" basis with the departmental secretary serving as coordinator. Whenever a member of the senior staff receives a request for speaking services which he feels can be adequately and constructively rendered by a resident, he turns the request over to the departmental secretary who then assigns this to the resident. The latter contacts the requesting group and makes the necessary arrangements for the talk. He then consults the appropriate senior psychiatrist who acts as his supervisor in this matter. Thus if the talk is for a parent-teachers association group on emotional problems of adolescents, he is supervised by the director of the Child Guidance Clinic, etc. In this manner the resident learns early how to cope with a type of service he will doubtless be called on to meet repeatedly in his professional career.

Discussion

In large measure this program is designed to meet the criticisms of psychiatric residency programs implied in the report of the 1952 Cornell Conference: "Generally speaking, residency programs do not prepare the psychiatrist to grasp the opportunities for preventive psychiatry and make the most of them. They do not assist him in achieving a dynamic concept of the community or equip him to guide and cooperate with ancillary workers and many other kinds of specialists in the rapidly expanding field of promoting mental health.

If the psychiatrist is to contribute to public health through the practice of preventive psychiatry, the dency program must help him develop certain assets over and above those now commonly recognized as related to the subject matter of the specialty-For the larger community purposes, the psychiatrist needs a broader understanding of, and skill in, communication. The importance of communication in the conventional physician-patient relationship is recognized; communication, both verbal and non-verbal, about matters of great emotional import is a major tool of psychiatry. Not so clearly seen is the importance of communication in group contacts, with families, professional and lay organizations, the local community, and a wider public -He should know how to convey his ideas both as a collaborator and as an educator."

Unfortunately most psychiatrists, at the time they finish their residency training, are largely unequipped by such training to fill the leadership roles in which the community is likely to place them. And in this day of "comprehensive medicine" the psychiatrist is being expected more and more to fill a leadership role not only in teaching institutions but in the community. Much of the future success of our specialty will depend on how well we are equipped to meet at least some of these needs. This report deals with the programs we are currently using at Duke University School of Medicine. It would be unfair to claim this program entirely as of our own planning. At least portions of this program have been used at the University of Colorado School of Medicine and the Colorado Psychopathic Hospital where they were developed and utitized by Dr. Franklin G. Ebaugh, Dr. Edward Billings, Dr. Jules Coleman, Dr. John Lyon, Dr. Cotter Hirshberg, Dr. Robert Stubblefield, and others, including two of the authors of this paper.

The results of this aspect of a psychiatric training program are obviously very difficult to evaluate. Even assuming it could be done, which is doubtful, it is much too early to judge its effectiveness in terms of the particular success of our trainees in their post-residency careers. This is, of course, where the real "payoff" comes and hopefully we may someday be in a position to evaluate this outcome. Despite the anxiety provoked in many of the residents by certain of the above activities, they almost universally look forward to and express satisfaction with this aspect of their training. We do find their contacts within the hospital in dealing with nonpsychiatric personnel becoming progressively more effective. We believe that the psychiatric service has become a much more important and well integrated part of the hospital community, and we believe it is largely due to this aspect of the program. It has clearly resulted in improved psychiatric services within the general hospital and in a very marked increase in the consultation rate. Thus within the limited community of our own hospital, we can see definite gains from this training. In the future, we hope to see concrete benefits within the community at large.

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Un programa especial de enseñanza para psiquiatras residentes en Hospital

El psiquiatra, más que ningún otro especialista médico, hoy día se ve frecuentemente obligado a comunicar conocimientos y consejos profesionales a personas e instituciones que necesitan tal información para el desempeño de sus funciones. Desgraciadamente, en estos días de Medicina "comprensiva" en que la demanda de tales servicios está creciendo, pocos son los jóvenes psiquiatras preparados para desempeñar tal papel en su comunidad. El presente trabajo es un informe sobre un programa de enseñanza, para psiquiatras residentes en Hospital, que se está llevando a cabo por la Escuela de Medicina de Duke University (N. Carolina). Este programa, de tres años, no es completamente nuevo, ya que partes de él habían sido llevadas a la práctica por la Escuela de Medicina de la Univ. de Colorado y el Colorado Psychopathic Hospital. Descrito detalladamente en este informe, dicho programa tiene por objeto, especialmente, desarrollar en los jóvenes paiquiatras las cualidades y habilidades necesarias para poder cumplir la importante función de guía en el campo de la Salud Pública y Medicina Preventiva que nuestra moderna sociedad exige de él. Aunque, desde luego, el alcance de ese programa es limitado, ya que de ningún modo podría abarcar todas las situaciones y problemas correspondientes a esa función, al poner el énfasis en la relación y comunicación de los residentes psiquiatras con los miembros no psiquiatras del Hospital, se considera que los estudiantes llegarán a familiarizarse con uno de los aspectos más importantes de la tarea que el futuro psiquiatra ha de cumplir cuando, en su papel de consejero y guía de la comunidad, se halle en contacto con las familias, grupos cívicos e instituciones sociales que piden de él colaboración y orientación más allá de sus habilidades puramente profesionales. Aunque todavía resulte imposible evaluar los resultados de dicho programa en términos concretos, ya que sólo en el curso de la práctica futura de los estudiantes se notarán sus efectos, los autores del presente informe creen que al menos puede decirse que durante el tiempo en que está funcionando ese programa de enseñanza, el servicio psiquiátrico se ha ido convirtiendo en parte más importante y mejor integrada que lo era dentro de la comunidad del Hospital, y que se puede esperar que más adelante el público en general notará sus efectos beneficiosos.

Predictor Variables Employed in Research on the Selection of Medical Students

EDWARD GOTTHEIL AND CARMEN MILLER MICHAEL

Introduction

A LL MEDICAL schools are faced with the problem of finding an adequate method of selecting students. Not only are there more applicants than there are places for students (74), and not only is it desirable to reduce the number of students who fail to graduate, but adequate selection is desirable in order to choose those students who will make the "best" doctors.

Presumably, the goal of medical education is to produce "good" doctors of medicine. What constitutes the good doctor however, and how to evaluate the constituent factors remains the most perplexing problem in the field. This question represents the fundamental problem basic to all other problems in selection. Many writers have recognized that in evaluating candidates for medical school potential success must be considered at the professional level as well as at the student level (1, 13, 19, 28, 31, 33, 54, 57, 60, 62, 69, 71, 81, 85, 86, 88, 89, 91, 94). It is extremely difficult, however, to imagine an operational definition of a "good doctor" which would be broad enough to include the different qualities necessary for the general practitioner, the specialist, the teacher, the research worker, etc.

There have been attempts to define

the attributes of the good doctor (1. 12, 84, 85) but, understandably, these definitions have been vague and not subject to quantification. As a result of the difficulties inherent in this task, many or most researchers in the field have assumed that medical school success is significantly related to success in later medical pursuits and have concentrated their research on finding methods of predicting medical school success. There is usually a further assumption that medical school success is reflected by medical school grades. The ease of obtaining records of medical school grades, and the ready quantifiability of these grades, has helped to foster this approach. On the other hand, if grades are to be used as a criterion in experiments on the selection of medical students, it will sometime be necessary to assess more clearly the relationship existing between such grades and the quality of future work in the medical profession.

The use of medical school grades as a criterion against which to evaluate the success of a selection program is not only subject to criticism on the grounds that grades may not be correlated with the quality of later practice of medicine, but there is an even more basic idea to consider: whether medical school grades are in themselves statistically reliable (3, 4, 6, 20, 25, 30, 31, 33, 41, 46, 49, 64, 80,

95). There has been much doubt regarding the consistency and meaningfulness of grades, which various studies have shown to differ from school to school, year to year, and course to course. The lack of reliable, valid, operational criteria accounts for a major portion of the difficulties that have hindered the development of more successful selection procedures. A number of medical schools are now using examinations of the National Board of Medical Examiners (7, 29), and this procedure may help solve some of the problems.

The number of failing students in medical school with its attendant loss in time, money and energy and resultant disappointment to students and faculty has also been a matter of great concern. The number of failures has been used as an argument to justify the need for selection programs (33, 57, 58, 94) and also as evidence of the failure of these programs. Neither of these arguments is necessarily valid. No matter how select a group of students, there will be better ones and poorer ones, and in some schools the poorest students may be failed although they may be superior to passing students elsewhere. Failure may imply class rank, but failure does not necessarily indicate true level of ability. Therefore, the percentage of failures should not in itself be employed as an argument either for selection, or for the failure of selection programs. A more important question regarding failures is whether the proper students are being failed, and this problem is related to the reliability and validity of the techniques employed for grading achievement.

In spite of the many complex problems, there has been no lack of enthusiasm in the attempt to find and develop suitable measures for the prediction of success in medical schools. Since a great diversity of selection procedures, or predictor variables, have been used by different medical schools, it was felt that it might be worthwhile to group and discuss some of these variables that have been employed as aids in selection.

PREDICTOR VARIABLES

Table 1 presents a classified list, together with bibliographic references, of some of the measures which have been used to predict success in medical schools. This list is not considered to be exhaustive, but it is indicative of the number and variety of techniques that have been employed and would be of use as a source of references. The broader categories will be discussed as follows.

Premedical grades

The many arguments raised concerning the use of grades as a criterion of achievement in medical school pertain also to the use of premedical grades as a predictor variable. In addition, premedical grades which are to be evaluated by admissions committees originate from many different colleges and universities. Yet, premedical grades have been the best and most consistent single variable for the prediction of success in medical school. Correlation coefficients have been reported between premedical and medical grades ranging from 0.27 to 0.60 (3, 5, 14, 15, 20, 33, 45, 46, 47, 48, 49, 51, 64, 69, 80, 90, 95).

Stuit (82) noted that when correlations between aptitude test scores and medical grades were corrected for restriction of range, the magnitude of the coefficients became approximately equal to that obtained between premedical and medical grades. However, premedical grades are the most widely used selection measure and medical students thus selected are consequently restricted in range of scholastic achievement. A study performed by Dodds (14) demonstrated the effect of restriction of range on the magnitude of these correlation coefficients. During the period from 1932 to 1934, 220 medical students were admitted to the University of West Virginia, These students were admitted on the basis of having fulfilled the required number of hours in subjects advocated by the university. Under these conditions, a coefficient of correlation of 0.46 was obtained between first year medical grades and the Moss Aptitude Test, and 0.60 between first year medical grades and premedical grades. Students were then selected on the basis of their scholastic standings and only 70 applicants were admitted from 1935 to 1937. Under these conditions, where the range in scholastic achievement was restricted, both of the above correlation coefficients decreased in magnitude. These coefficients were 0.39 for the aptitude test and 0.28 for the premedical grades. The noticeable decrease occurred in the case of the premedical grades, upon which the selection program was based.

A number of varied qualities and attributes are reflected in scholastic grades. Intelligence, aptitude, and achievement are measured in some part by scholastic tests, be they of the objective or discussion type. Furthermore, instructors form subjective impressions of the students; and such impressions have been shown to influence grades either directly or indirectly. However, the composite of factors which determines grades in premedical school determines grades in medical school

as well; and thus, premedical grades remain the best single predictor of medical school grades at the present time.

When premedical grades are combined with aptitude test scores, the correlation coefficients between this combination and medical grades are greater than the coefficients obtained with either of the two variables used alone (15, 20, 45, 48, 54, 64). This is probably due both to a more satisfactory estimate of medical aptitude, and also to an estimate, though rough, of the other factors important in earning grades in medical school.

Aptitude tests

Medical aptitude tests designed for use on a national scale have been developed to meet some of the disadvantages attributed to the use of premedical grades in the selection of medical students. Moss (49) devised the first such test for the Association of American Medical Colleges. When it was first used, the results seemed promising. However, as the test gained wider acceptance, it began to be used as a selection device and the magnitude of the reported coefficients of correlation between the aptitude test and medical grades decreased in size. In 1946 the Moss Committee was dissolved. Other aptitude tests were then devised and replaced the Moss Test in selection programs. Following this, research studies using the Moss Test again showed it to be of considerable value in predicting medical grades. It would appear then that the test was of value, and that the low coefficients which were reported were probably due to the effect of an increased restriction in range when the test was used as a selection measure.

In order to demonstrate that his aptitude test was not merely a general test of intelligence, Moss (53) compared the performance of medical freshmen with other groups of professional students on this medical aptitude test. He found that medical students earned vastly superior scores to all other groups tested. He also found a considerably greater correlation coefficient between medical aptitude scores and medical grades than he did between these aptitude scores and grades earned by students in the other professional schools. He concluded that the Moss Aptitude Test was not a test of general intelligence and that it did measure some of the traits necessary for success in medical school. He also demonstrated (51) that the aptitude test predicted more accurately than did premedical grades the failures and high ranking students in medical school. It is suggested that this may be partly a result of the fact that instructors' grades tend to cluster about the median, whereas the aptitude test may discriminate in all portions of the distribution.

The Professional Aptitude Test, constructed by the Graduate Record Examination Office, was introduced in 1947. It is composed of a number of subtests and provides scores for Scientific, Social and Humanistic Verbal Abilities, Quantitative Ability, Premedical Science Achievement, and an Index of General Ability. In 1948 the name of this test, which actually included subtests covering both aptitude and achievement, was changed to the Medical College Admission Test. In addition, the subtests were rearranged and only four scores are now reported. These are Verbal Ability, Quantitative Ability, Understanding Modern Society, and Science. Reliability coefficients of 0.90, or above, have been reported for these four indices (70, 73).

Both of these tests were sponsored by the Association of American Medical Colleges and were designed to take the place of the Moss Aptitude Test. They were widely accepted and many schools incorporated them in their selection programs. It is perhaps due to the enthusiastic use of these tests in selection, and a concomitant restriction in range, that the results of validating studies have not been very impressive (21, 33, 48, 58, 59, 83, 92, 95). On the other hand, in spite of the restriction in range problem, Dykman and Stalnaker (16) found surprisingly good results with the MCAT.

There have been several aptitude tests developed by independent workers (5, 15, 58, 59, 86). These tests were adapted to local populations and have generally resulted in somewhat greater validity coefficients than have the Association-sponsored tests.

In general, however, aptitude tests are advantageous in that they provide a uniform and standardized scale for the evaluation of student candidates, regardless of the premedical school they attended. In addition, aptitude tests serve to delineate an interesting group of cases. This group is characterized by a discrepancy between ability as reflected in aptitude tests and achievement as indicated by premedical grades. It is suggested that the recognition of this discrepancy may permit a more adequate appraisal of the individuals in this group (10, 19, 87). For example, high grades combined with a low aptitude score might reveal a very hard worker with intense interest and motivation who could succeed in his medical work; or perhaps such a combination might occur in an individual driven by neurotic needs who might break down under the increased pressure and competition of medical school. A high aptitude score in an individual who would be automatically screened out on the basis of poor grades might reveal not only lack of interest or motivation, but might also suggest remediable problems such as illness, family difficulties, overindulgence in extracurricular activities.

Hurd (33) studied 11 achievers and 6 non-achievers, who were selected on the basis of discrepancies between intelligence test scores and undergraduate grades in physics. He found that the achievers were characterized by greater interest in the subject than the non-achievers, and by character traits such as determination, thoroughness, and ambition. Schofield compared 11 high ranking students who were matched for aptitude with 11 low ranking students in a junior medical class. The profiles of these two groups on the Minnesota Multiphasic Personality Inventory were quite similar but ". . . poorer achievers are characterized by a tendency to unrealistic appraisals of their environment, unhappy social relationships, and autistic rumination. Also, the poorer achievers show a general tendency toward a relatively unsophisticated denial of personal weaknesses and the expression of an idealized self-concept (L). In this regard, the students who work up to capacity tend to manifest a more realistic self-appraisal" (67, p. 47). Shoemaker and Rohrer (69) have also studied the personalities of overand under-achievers. (Their study will be mentioned again in the section on personality tests.)

Intelligence tests

Correlation coefficients between tests of general intelligence and medical grades have generally been low in magnitude, and have added little when incorporated in multiple regression equations (4, 21, 23, 36, 43, 64, 69, 91, 92).

It may be questioned whether increments in intelligence quotient beyond a certain necessary minimum add to the chances of performing satisfactorily in medical school, or whether other attributes such as aptitude, interest, motivation, and personality then become more important. Promising medical school candidates undoubtedly constitute a highly selected group on the basis of intelligence, and correlations may naturally be expected to suffer from a restriction of range.

Achievement tests

The results obtained with the various achievement tests differ according to the areas tested. When premedical science achievement, quantitative ability, or scientific vocabulary are involved the reports are favorable. Watson (92), for example, found that the Cooperative Chemistry Test and the Cooperative Zoology Test correlated to a significant degree with medical grades. (However, these tests, taken singly or in combination with the Professional Aptitude Test, were not thought to increase significantly the predictive value of the PAT alone.) When other areas, such as the liberal arts, are involved the results are unfavorable. Vaughn (89) found this to be reflected in a fairly stable profile for premedical students on the Graduate Record Examination. These students obtain higher scores in science and lower scores in sociohumanistic studies than the general average of students at the same level of education.

These findings add further emphasis to the question of what qualities are desirable in medical students. One may ask, for example: to what extent can or should a broad cultural background in the socio-humanistic field be sacrificed for outstanding achievement in science?

Reading tests

For the most part, reading tests

have proved to be disappointing predictors of medical school success. Two studies, however, show some promise. Glaser (21) reports a correlation coefficient of 0.48 between the USAFI Reading Test and medical grades. At the University of Oklahoma (69) a local reading test correlated 0.44 with medical school grades. Reading ability is, of course, a composite of many abilities and it is therefore felt that further research is indicated and that the tests found useful should be analyzed with regard to their contents and procedures.

Interest tests

Many students fail to do satisfactory work in medical school although they have the necessary "ability." In addition, there are many students who withdraw for reasons other than scholastic failure (32, 34). It has been generally appreciated that interests are important in keeping the student consistently motivated to produce work of a high caliber throughout the years in medical school, In fact, many admission officers, in an attempt to gauge this interest, routinely ask candidates such questions as why they wish to study medicine (37).

Interest blanks are not designed simply to indicate intensity of interest. More important than the intensity of an individual's interest in medicine at the time of application is whether medicine in fact and practice rather than conception, will continue to interest him. Interest questionnaires are designed hopefully to evaluate this latter question. To this end, an attempt is made to estimate the extent to which an individual's interests, his likes and dislikes, are similar to those of individuals who are successful in the field. If his interests are like those of successful physicians then it is thought to be probable that medical work will continue to stimulate and interest him.

Strong (78) developed a physicians' scale for his Vocational Interest Blank to be used in vocational guidance. Benton and Kornhauser (2) demonstrated that individuals could voluntarily increase their scores on Strong's physician interest scale if they tried to do so. As a result, studies using this Vocational Interest Blank for selection rather than guidance have proved disappointing (15, 69, 91).

In a 20-year follow-up study, Strong (77) found that the higher the physician interest score while in college, the greater the chance of becoming a physician. Jacobsen divided students into groups according to their interest patterns and found that these groups differed in their achievement in the various medical school courses. "These differences in performance raise interesting questions as to methods of teaching and the significance of particular course content and of instructors' attitudes for different types of students" (35, p. 161). Gough (23) has been developing the Medical Preference Inventory. He found, for example, correlation coefficients of 0.62 and 0.53 between this Inventory and grouped staff ratings of Potential Success and Effectiveness as a Physician and Surgeon, respectively. The forced-choice technique, which is felt to be fairly resistant to faking, is used in this test. Some cross-validation studies have been done.

Personality tests

It would appear that personality evaluation must be given a very important role in any selection program. The stresses of medical school may severely test the stability of the personality (9, 22, 27, 63, 75). And while

anxiety limits learning potential, decreases the capacity to withstand frustration, and interferes with the formation of effective social relationships, it is desirable, if not necessary, that students apply their full resources to the difficult medical curriculum. Then, too, there is the question of the maladjusted individual who may successfully meet the requirements of the medical curriculum. There are many examples in the history of the arts and sciences which attest to the fact that personality conflicts do not necessarily prohibit distinguished achievement. However, one may ask whether such individuals, or which ones, meet the desirable or necessary criteria for good physicians who must daily make decisions involving the lives of critical patients.

Kohl (39) noted that over a period of time, on the average 25 per cent of the medical student body requested psychiatric assistance. He did not feel that this was especially unusual since these students had more insight and were living under greater stress than the general population.

Responses to student questionnaires (18, 76) have revealed that many students felt that they had developed neurotic symptoms after entering medical school. In addition, many believed that their health had become worse, that they were not receiving sufficient sleep, exercise, recreation and social life, and that they had become more easily fatigued, restless and irritable. More than half of the students were employed in various part-time jobs and felt that this was an additional burden. Nevertheless, the majority found their school work stimulating and were happy and content with their training.

The Rorschach Ink Blot Test has at times been employed to assess the personality characteristics of medical students and to study personality differences which might account for differences in the accomplishments of these medical students. Waggoner and Zeigler (91) believe that medical school success can be predicted with some assurance on the basis of the individual Rorschach, the psychiatric interview, and other psychological tests. A number of tests, including the individual Rorschach, were given to 148 freshman medical students. Out of the group of 148 students, eight were dropped from the medical school for academic failure. Waggoner and Zeigler report that "of the 8 failing students, Rorschach examination showed definite disturbance in the seven cases in which it was available" (91, p. 374). However, the authors do not indicate that disturbance was not also shown in the Rorschachs of the passing students. The authors did say that following psychotherapy many failing students were able to continue in medical school and do satisfactory work. They conclude that personality maladjustment interferes with satisfactory medical school work and that in many cases these problems are remediable.

Shoemaker and Rohrer (69) analyzed the Rorschach records of the 12 highest and the 12 lowest ranking students in a class of 77 at the University of Oklahoma. The experimenters reported that there was a differential pattern found in Rorschach results for over- and under-achievers as measured by the results of the Professional Aptitude Test and the grade points earned in the first year medicine.

Brosin (4) included individual or group Rorschach tests in a large battery of tests administered to 450 medical students from two different schools. A statistical analysis was done on the results of the Group Rorschach (using the Monroe check count) which was administered to two classes of 130 students at one school. The analysis was made in terms of the criterion of first-year grade-point average for three quarters. The results of this analysis were disappointing, and offered little hope that the Group Rorschach would furnish a means of differentiating students. The results were distinguished by the frequency of abnormal responses in almost all the Rorschach records. Brosin indicated that the group tests were not likely to provide a means for differentiating between emotional disturbances which are incapacitating and emotional disturbances which are compatible with achievement. He concluded, however, that "The individual Rorschach in conjunction with the individual interview by a psychiatrist is by all odds the best method known to us for selection purposes" (4, p. 465).

Molish and Molish (44) administered the Rorschach individually to 60 senior medical students and compared their responses with those of other groups of individuals of superior intelligence. The author's reported that there were some significant differences between the medical students and the other subjects. However, no attempt was made to discriminate between high-ranking and low-ranking medical students.

Eron (17) compared the Rorschach protocols of 35 senior medical students, matched for age and sex, with 35 senior divinity students. Single scores and combinations of scores were analyzed and only two statistically significant differences were found between the two groups of students. These differences would be expected on the basis of chance alone, since so many variables were involved. Thus, those characteristics

which other authors (4, 44, 69, 91) have considered to be uniquely delineative of medical students as a group were not substantiated by the findings of Eron's study. The judges were not able to distinguish the Rorschach records of the highest ranked 10 medical students from the lowest ranked 10 students. He concluded that although the use of the Rorschach may have merit in individual cases, the general use of the Rorschach in the selection of medical students is not justified.

These conflicting views regarding the value of the Rorschach as a selection technique strongly indicate a need for further work with this instrument.

Glaser (21) found that there were abnormal elevations on one or more of the MMPI scales in 20.6 per cent of 150 medical students. However, a correlational analysis revealed no significant relationship between these abnormal elevations and medical grades, or between scores on the separate scales and medical grades.

Schofield (65) compared the MMPI profiles of freshman male medical students, advanced male premedical students, general population, and college students. The medical and premedical students were generally quite similar in their MMPI profiles. And while in terms of high-point frequencies, the medical groups were found to be more like each other than like a general male college sample, a comparison of the mean MMPI profiles of the medical students with those of other samples of male college students did not suggest any basic personality pattern distinctive for the medical group. Schofield (66) also compared the MMPI profiles of the freshman medical students with their own profiles when they became juniors. Some significant changes were reported. Finally, Schofield (67) in-

vestigated the relationship between the freshman year MMPI profiles and academic performance, using total honor point ratio at the end of the junior year of medical school as a criterion. A study was also made of the relationship between amount of personality change between the freshman and junior years and scholastic achievement. No significant difference was found between the honor point ratios of students having the largest MMPI changes and the honor point ratios of students having the smallest MMPI changes. However, some relationships were found between the freshman MMPI profiles and the honor ratios when students were matched for academic aptitude (ACE scores).

Jacobsen (36) found the Minnesota Personality Schedule somewhat helpful. Other personality tests have been employed and have not been found to be especially promising.

Interview

Most medical schools either suggest or require an interview as part of their selection procedure. In such an interview an attempt is made to appraise the individual as a whole, over and above the grades, test results, and other available background information. The interview is concerned with the individual's appearance, carriage, personality, interests, and motivation, or those areas which are most difficult to test objectively.

The interview is assigned an important place in the selection program by Brosin (4) and Waggoner and Zeigler (91). Hurd (33) reports a correlation coefficient of 0.39 between personality ratings based on interviews and first year medical grades. Taylor considers the personal interview to be among the most reliable techniques for the selection of

successful medical students. "It can be used effectively to select the applicant who inspires confidence, the one who has a personality defect, the potential troublemaker, the emotionally unstable, those with a capacity for leadership, those with breeding and poise, etc." (84), p. 171). Wood, et al (93) believe the interview is valuable especially in selecting the good physician rather than the good student. On the other hand, Moss (50) found interview ratings to have little predictive value. And Stalnaker (72) suggests that interviews may give rise to more false than correct information.

The aims and techniques of the interview vary greatly from place to place. It may be quite casual; Brosin (4) suggests that it is more important to get spontaneous discussion rather than factual information. Or there may be a formal, organized "test;" at Emory University (93) an attempt was made to put the student under pressure and observe his reactions to other students and to authority. There may be single or multiple interviewers or interviewees present. The interviewers may be deans, teachers, psychologists, or psychiatrists. Whatever the technique, it is felt that better results are obtained to the extent that the aims and objectives of the interview are clearly stated and clearly understood by the interviewer. There are several programs (23, 40, 61, 79) directed toward improving interview ratings in this regard and attempts are being made to develop valid and reliable variables which can be clearly defined and easily rated under standardized conditions.

In general, this has been done along the following lines. Interview ratings of potential success in medical school along a point scale took the place of mere general appraisals of good versus poor. Next, qualities which were considered important to potential success were listed, defined, and rated. The reliabilities of these ratings were computed and their validity investigated by correlations with instructors' ratings of achievement.

Until more adequate tests of personality traits and interests are available, the personal interview must continue to be of great importance to the selection program. Consequently, further work is needed in refining the interview technique. Some of the problems involved are (a) the optimum number of interviewers, (b) the optimum number of interviewees, (c) formal versus informal approach, and (d) the development of adequate rating variables in the areas of social adaptability, interests, motivation, and personality.

Background variables

There have been many attempts to demonstrate some relationship between success in medical school and variables such as age, number of college hours, and type of college course, Results of these investigations have varied remarkably. Moursund (56) found that students with the B.S. degree do better than those with the B.A. degree. Stuit and Schlicher (82) report just the reverse. Schlesser and Roberts (64) could find no significant difference in medical achievement related to the premedical major course of study. A greater number of failures and withdrawals from medical school was noted in the older groups of students by some authors (16, 42, 45, 46, 59). However, Moon (46) found there was no difference in the grades obtained between a group of older students who completed the medical curriculum and younger groups of students. Other authors consider that there is little relationship between age and grades (8, 15, 69). As concerns the relationship between medical grades and the number of college hours, some studies report a negative relationship (46, 56, 82), some report no relationship (33, 49, 69), and in 1927, a positive relationship was felt to exist (94). None of these studies was controlled for ability and aptitude, and as a consequence there are no satisfactorily valid conclusions that can be drawn about the effects of age, number of college hours, and type of college course per se. Students who are accepted with the minimum number of college hours required are usually young and have superior records, or else they would not be selected over other candidates with greater preparation. Before the number of college credits required for entrance was increased, students with greater preparation were usually found to do better in medical school. These were individuals who were interested in gaining a broad education. Currently, those students with more college hours are often individuals who were not admitted earlier on the basis of poorer grades. In order to investigate the influence of these variables, age and the number and type of college credits, the influence of ability and aptitude must be considered, measured, and held constant.

High school grades are generally found to show some relationship to medical grades, though this is slight. Marital status has not been shown to have any consistent relationship. Hurd (33) found that students from urban communities tended to do better than those from rural areas and wondered whether urban life provided more social experience, maturity, and sophistication, or merely better schools. He also noted that in

Virginia, students from universities did better than those from colleges, although a breakdown to individual schools showed no statistically significant differences. One might question whether the noted difference was a result of better education provided in the universities or whether better students go to universities. Again, this cannot be answered until aptitude and ability are held constant. It is interesting to note that there was no demonstrable relationship to father's occupation and, contrary to expectations, students of medical parentage did not do as well as the average (56, 82).

STATISTICAL CONSIDERATIONS

The results obtained in various attempts to predict medical school achievement have not appeared to be highly impressive. Many psychological tests have been applied and additional ones have been developed. In general, these have not improved upon or even equalled the efficiency of premedical grades in predicting medical grades. Nevertheless in those instances when attempts were made to assess, weight, and combine the different factors necessary for achieving satisfactory grades (such factors as ability, interest, personality, and achievement), the results were more encouraging. Multiple correlation coefficients have been reported ranging from 0.52 to 0.66 with an average of 0.58 (15, 21, 48, 58, 59, 64). In addition, the magnitude of reported correlation coefficients has frequently been decreased by the effect of restriction in the range of cases selected for study. Morris (48) obtained a corrected coefficient of 0.73. Mitchell (43) reported a correlation coefficient of 0.15 between the Stanford-Binet and senior medical grades. When this was corrected for restriction in range the magnitude of the coefficient increased to 0.60. Another factor worthy of consideration is the use of correlation ratios. Guilford commented on the use of the product moment correlation based on the assumption of a rectilinear regression of criterion measures upon test scores, "It is not known how many such coefficients are very low, or even zero, whereas a correlation ratio might have been of substantial size. The possibility of non-linear regressions is probably greater for nonaptitude measures than for aptitude measures" (24, p. 73). Thus despite the many limitations of the criteria and predictor variables used in the selection of medical students, it would appear that predictions may actually be considerably more efficient than they have been generally thought to be.

Summary

In spite of numerous complex problems, many investigators have addressed themselves to the task of finding suitable methods of selecting medical students. Although everyone recognizes that medical school success may not be satisfactorily predictive of later professional fitness, most of the studies on selection have used medical school success, usually defined in terms of medical school grades, as the criterion against which the selection techniques are evaluated. Since a great diversity of selection procedures, or predictor variables, have been used by different medical schools, it was felt that it would be worthwhile to group and discuss some of these variables that have been employed as aids in selec-

The predictor variables especially discussed were premedical grades, aptitude tests, intelligence tests, achievement tests, reading tests, interest tests, personality tests, the interview, and certain background variables. Some statistical considerations were also mentioned.

It appears that psychological tests, especially when used in combinations, do a more efficient job of predicting medical school success than is generally supposed. Further progress should be attainable with the development of more reliable and valid measures of the various factors necessary for success in medical school.

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Variables

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TABLE 1

List of Predictor Variables Employed in Research on the Selection of Medical Students

Grades	
High School	15, 30, 62, 64
Premedical	3, 5, 14, 15, 20, 25, 33, 45, 46, 47, 48, 49, 51, 56, 64, 69, 80, 82, 84, 90, 94, 95
Aptitude tests	
General Aptitude Test Battery	58, 59
Medical College Admission	16, 23, 57, 59, 68, 70, 82, 83
Minnesota Aptitude	5, 15
Minnesota Clerical	38
Moss Aptitude	5, 14, 15, 20, 25, 30, 33, 36, 43, 45, 46, 49, 51, 52, 53, 54, 55, 62, 64, 69, 80, 90, 95
New York Aptitude	86
Professional Aptitude	21, 33, 48, 58, 69, 82, 83, 92, 95
Intelligence tests	
ACE	4, 31, 64, 67
AGCT	21
CAVD	36, 92
California Mental Maturity	91
Kuhlmann	4
Miller Analogies	21, 38
Otis	31, 33, 43
PMA	4. 57

Predictor Variables Used in Research on Student Selection-(Table 1 cont'd)

Shipley-Hartford	91		
Stanford-Binet	43, 91		
Terman Concept Formation	23		
Vocabulary	69		
Wechsler-Bellevue	40, 91		
Wonderlich	36, 92		
Achievement tests			
Arithmetic	31, 69		
Classification Inventory	57		
Cooperative Zoology	92		
Cooperative General Chemistry	92		
Grace-Arthur Performance	91		
Graduate Record	33, 89		
lows Qualifying	43, 90		
IPAR for Graduate Achievement	23		
Spatial Relations	15, 21, 23		
Reading tests			
Haggerty	36		
Minnesota	15, 92		
Nelson-Denny	91		
Oklahoma	69		
Speed of Roading	38		
Traxler	91		
University of Chicago	4		
USAFI	21, 69		
Virginia	30, 31, 33		
Writing tests			
University of Chicago	4		
Study habits			
Inventory	82, 91		
Interest tests			
Kuder	38		
Medical Preference Inventory	23		
Strong	2, 15, 24, 35, 36, 38, 40, 57, 69, 77, 78, 80, 91		
Personality tests			
Allport-Vernon	4, 57		
Bernreuter	91		
Gough Adjective	23		

Humm-Wadsworth	91
Minnesota Personality	4, 36
MMPI	21, 65, 66, 67
Picture Reaction	40
Rorschach	4, 17, 26, 40, 44, 57, 69, 91
Szondi	40
TAT	4, 40, 57
Temperament Scale	57
Word Association	40
nterviews	
Techniques and Ratings	4, 23, 28, 33, 40, 50, 57, 61, 79, 84, 91, 93
lackground variables	

nground variables	
Age	15 16, 42, 45, 46, 56, 69, 82
Father's Occupation	33, 56, 82
Major Course of Study	11, 15, 56, 64, 68, 69, 82, 85
Marital Status	69
Number of College Credits	33, 45, 46, 49, 56, 69, 82, 94
Residence	33, 69

Algunos métodos usados en los Estados Unidos en la selección de estudiantes de Medicina

Aunque hasta hoy no ha sido posible encontrar métodos absolutamente seguros en la selección de los estudiantes de Medicina (se-lección inevitable en los Estados Unidos, donde el número de los aspirantes a entrada en los Colegios de Medicina excede con mucho a las facilidades disponibles), y aunque no se está aun de acuerdo sobre los criterios que deben aplicarse en esa selección, no han faltado intentos de encontrar y desarrollar medidas y tests aptos para pronosticar las posibilidades de éxito o fracaso de un estudiante que quiere dedicarse a la carrera de Medicina. Esos tests y métodos de predicción varían mucho según las diferentes Escuelas en que se aplican. Los autores del presente trabajo hicieron un estudio detenido de ellos, agrupándoles en diferentes categorías y discutiendo sus respectivos méritos y defectos, con ayuda de tablas y de una extensa bibliografía, de la cual se dan referencias al final de este informe.

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un minimum de 25 lectores.

Medical Education in 19th Century France

ERWIN H. ACKERKNECHT

N FRANCE the great turn in medical education, away from medieval tradition, came about many decades earlier than in Germany and Great Britain. It came as a byproduct of the great revolution of 1789. The 19 old medical faculties, and their products, which we know from Molières's famous plays, caricatures of medieval medicine, were the object of innumerable complaints in a country in which, outside the universities, science had made such tremendous progress towards the end of the 18th century with men like Lavoisier, Laplace, Lamarck or Jussieu. A committee of the first revolutionary assembly, the Constituante, headed by Dr. Guillotin, submitted in 1790 a reform program, based on the ideas of Vicq d'Azyr, the famous anatomist and secretary of the progressive Royal Society of Medicine. The political events progressed too rapidly to bring it to application. In September 1793 all universities and academies of the ancient regime were simply abolished.

Yet the country needed trained doctors more badly than ever. Six hundred had succumbed within 16 months in the armies of the revolution. Hopes that free competition would solve the problem were disappointed. No "free," that is, private or proprietary teaching had sprung up to replace the abolished institutions. In this emergency the Convention, the third revolutionary assembly, created three "Écoles de Santé," medical schools, which in a few years would again less correctly be called medical faculties, in Paris, Montpel-

lier and Strasbourg. With some important additions made in the early 1800's (creation of interns in 1802, creation of preparatory schools, of a caste of low grade practitioners: the officiers de santé,¹ and the necessity of an official degree for practicing in 1803) this law remained practically unchanged till the end of the century.² It was the work of the famous chemist and Jacobin (later servant of Napoleon), Fourcroy, and the surgeon Chaussier, and again mostly based on the ideas of Vicq d'Azyr.

Reborn

Medical education was thus reborn in France not through a university faculty, but in one of the glorious special (professional) schools which the revolution created at about the same time (Muséum d'Histoire Naturelle, École Polytechnique, École Normale). Condorcet had favored a new system of universities. But neither those revolutionaries who did the reorganization like Fourcroy, nor Napoleon, nor the Bourbons, nor the Orleans were favorable to a type of higher education transgressing the special schools. Napoleon reestablished the university only in name; in fact it had to wait for its rebirth in the third Republic and at the end of the century. Discussions in the revolutionary assemblies echo trends which have created difficulties for education in all modern societies: narrow utilitarianism, a hatred of the scientist as an "aristocrat," a blind belief in the mysterious workings of free competition. The freedom loving Jacobins had an additional fondness for overcentralization and pedantic school-like arrangements. Napoleon, the ex-Jacobin, turned dictator, and an heir to all the negative traits of his erstwhile comrades, abolished the modern secondary educational system, begun by the revolution, and replaced it by a medical system, centered around Latin, which up to this day makes the French medical student highly educated as well as ill prepared for his chosen career.

It was most fortunate that the state of medicine around 1800 made medical education fit very well into the framework of the special school. The sciences were not yet developed enough to provide foundations for medicine. Only the observations of the ward, and in the autopsy room could provide these. Thus medical education, as established by the revolution, was at its time by far the best and most progressive type of medical education feasible and available.

The basic idea of this reorganization was to center medical education in the clinic, the hospital, to replace exclusive lecture courses built on problematic "scientific" speculations by clinical observations. Actually medical education was put on the same foundations on which the new French scientific medicine, symbolized and immortalized by the names of Corvisart, Pinel, Laennec, Broussais, Louis, Andral, Bretonneau, and Trousseau, was to flourish during the next 50 years. We discern here the influence of the philosophy of Cabanis, who deducing all mental phenomena from sense impressions, had necessarily to base education primarily on such, and of the Paris surgeons who had developed clinical training shortly before the revolution and played such a role in the development of the new school. It was one of the greatest accomplishments of the new school to reunite medicine and surgery after centuries of absurd separation and useless strife.

Consequently the medical student did ward work in the hospitals of Paris and the special clinics, which the school had till 1878, every morning from his first to his last day in medical school, even when he had not yet acquired any knowledge of anatomy and physiology. The afternoons were devoted to lectures and laboratory work which at that time consisted almost exclusively of dissections. The battle cry of Fourcroy was "Peu lire, beaucoup voir et beaucoup faire" (Read little, see much, and do much). The corollary of this clinical orientation was contempt for theories and distrust of casual explanations, microscopic studies, animal experimentation, physics and chemistry, which at best could be admitted as mere handmaidens in the study and practice of medicine (see author's article "Elisha Bartlett and the Philosophy of the Paris Clinical School" Bull. Hist. Med. (24:43-60, 1950).

Medical school admission

Admission into medical school was dependent on a bachelor's degree. The duration of studies was four years of a graded curriculum with examination at the end of each year. The teaching was no longer done in Latin, but in French. The doctor's degree served as a national license. The professors received a sufficient salary to be financially independent from their students. All positions whether internship, chef de travaux (assistant professor), professeur agrégé (associate professor) or chair holding full professor (for the latter an exception was made later on) were reached by the so called "concours," that is, public competitive examination. No other country has to my knowledge adopted this method of selection which is perhaps more democratic in appearance than in fact, and puts a heavy premium on verbal facility. It was from the beginning combined with one of the worst features of the French university system: the right of permutation, that is, the right of the full professor to exchange his chair for another one. Scientific progress was discussed every month in a Société formed by the professors of the school, which existed till the foundation of the Academy of Medicine in 1820.

In 1794 the new school had 300 students and instead of the seven chairs of the old faculty it had 12, occupied by 12 full professors, each of them aided by a "professeur adjoint" (later on called agrégé). The 12 chairs were those of anatomy and physiology; medical chemistry and pharmacy; medical physics and hygiene; external pathology; internal pathology; medical natural history; operative medicine; external clinic; internal clinic; advanced clinic; obstetrics; legal medicine and medical history. On the list of the first professors we find such famous names as Hallé, Pinel, Corvisart, and the surgeons Desault, Boyer, Baudelocque, Chopart, Percy and Sabatier.

One needs only compare this system of medical education in its details with those current in other countries around 1800, in order to appreciate its tremendous superiority and to understand why for 50 years Paris attracted numerous students, not a few from the U. S. The Paris trained generation of American doctors is represented by some of the greatest figures in our medical history like O. W. Holmes, W. W. Gerhardt, and John Collins Warren. Yet American institutions of medical edu-

cation were at that time at such a low level that they proved unable to assimilate the progressive French methods.

Superiority lost

The French educational system, and with it and partly on account of it, French medicine lost their superiority, when due to rapid progress in chemistry, histology and physiology, science became in the middle of the century more and more the center of the new medicine. French medical institutions showed little ability to adapt themselves to the new situation. French medicine paid now the price for having been so far advanced, enacting only once more the so called law of combined development which has been observed in many other fields, for instance economics. A pioneer in industrialization like England, weighed down by outdated investments in old machinery and a feeling of superiority, was also outdistanced in production by two upstarts, Germany and the U.S., who coming later, could start with far more advanced machinery. By the middle of the century "clinicism" had become firmly entrenched in France and resisted reform vigorously. Due to the neglect of the universities no strong faculties of science existed to counterbalance the power of what to all practical purposes were not university faculties but hospital oriented schools. Science was segregated in other special schools. The situation was quite different in Germany, where a radical reform of the universities had kept medicine in the framework of the latter and created an ideal structure for the development of medical science.8 The French method of selection favored the orator, the German the original researcher. No wonder then that Germany took over leadership in medicine and medical education in the second half of the 19th century. This in spite of the fact that French discoveries contributed tremendously to the new era in medicine, that its two outstanding representatives, Louis Pasteur and Claude Bernard, were French. But it is equally significant for the make-up of the French medical schools of the period that neither of the great scientists ever was professor in one of them. The former made his career in the École Normale, the latter, after failing in the "concours," in those cases of disinterested research, the Collége de France and the Muséum. And these cases are not isolated. The same holds good for Magendie, for Flourens, for Paul Bert, for Brown-Sequard, for Donné, for Davaine and for Duchenne, to name only a few of the great French promoters of medical science who were never professors in a French medical school. The evil actually started earlier. Bichat, long since the symbol of the Paris medical school, failed its concours. Pierre Louis, the father of the numerical method, never even tried. All the teaching both men ever did was done in the form of the then still quite customary private courses.

Third republic

The reform, which should have come in the 1850's came only between 1878 and 1892 under the much maligned Third Republic, when science professors like Berthelot and Paul Bert became leading statesmen (for a while she was nicknamed "la républiqie des professeurs") and defeat in the French-German war of 1870-71 had sensitized leaders to possible omissions. The Third Republic created real universities, real faculties of science. In the medical

field it increased the weight of the basic sciences-now a first year had to be spent exclusively with physics, chemistry and biology—; laboratories for teaching and research were eventually built, specialty chairs erected, new faculties and preparatory schools opened, the "officiers de santé" abolished. At the end of the century France had six faculties and 18 preparatory schools; in the 1930's, when a new, very limited attempt of reform was made, mainly by adding a sixth clinical year, and new buildings, she had nine faculties and 15 preparatory schools. Paris has now over 50 chairs.

One cannot help feeling that the reforms have never been basic enough. The sciences have found a place in French medical schools, but have they really ceased to be "handmaidens"? The schools still teach their own (medical) physics and (medical) chemistry. The students still start in the clinic without previous knowledge of anatomy or physiology. The extreme centralization where every detail of teaching is decided upon for all schools in Paris has always made experimenting in education almost impossible, and has discouraged reform which immediately had to become generalized. Rigidity has even increased with the disappearance of free teaching. Monstrosities like the permutation system sur-

In 1925 in his searching analysis of medical education in the U. S., Germany, Great Britain and France, which is still of great meaning (dealing for instance with such "new" problems as integration) Abraham Flexner characterized French medical education as a particular "clinical" type, differing from the then generally (even in Great Britain) accepted "university" type; a type, which prefers a "natural" (empir-

ical) method of learning to a more scientific and logical one. Medical faculties were, according to Flexner, essentially hospital staffs engaged in teaching. This is perhaps too severe. But one needs only to read the discussions of the 1930's, to realize how deeply entrenched "clinicism," and the attitudes of 1850 still are in French medical schools. The French are very conservative people in spite of their liveliness ("Plus que ça change, plus c'est la même chose" is one of their most signifiant proverbs) and they are perfectly entitled to it. And let us not deceive ourselves. Even with their different educational system oriented towards practice, they produce medical scientists second to none. Their system was primarily created to produce competent practitioners. This goal is fully reached. It created superb practitioners and it still does. It is up to them to decide whether this is enough in our time and day. There are tendencies working in the same direction with different phraseologies in other countries. There is a real problem which has to be faced everywhere.

The history of French medical education is a glorious and instructive one. It shows the great advantages of a radical break with the past and of a practical approach. It also shows the fetters which the special school concept, narrow utilitarianism, rigid centralization, and clinging to tradition might put on the development of medicine and medical education.

Summary

1. All European countries produced such second rate practitioners during the 19th century in order to provide cheap medical help. The U S. "solved" this problem in the same period in henoring with the M.D. title practitioners of even lower educational status.

2. The purges of the Paris Medical School from old liberals in 1822, and from extreme royalists in 1830, are interesting examples of the impact of politics on scientists' careers, but did not in any way influence the educational system as such.

 Shortcomings in German medical education like the prevalence of lecture courses in turn derive clearly from survival of old university methods and traditions.

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La Educación Médica en Francia durante el siglo XIX

Fué a raíz de la Revolución de 1789 cuando Francia rompió con la tradición medieval en la Educación Médica e inició un cambio radical que precedió, en varias décadas, a las reformas que tuvieron lugar en Inglaterra y Alemania. En 1793, todas las Universidades y Academias del "Ancien Régime" fueron abolidas. Como había gran necesidad de médicos, ya que un gran número de ellos habían perecido luchando con los Ejércitos revolucionarios, la Convención creó, como medida de emergencia, tres "Ecoles de Santé", en París, Montpellier y Estrasburgo. Asl, la Educación Médica moderna nació en Francia no en el seno de las Facultades de Medicina, sino en Escuelas profesionales especializadas, en las que el hospital se convirtió en centro de estudios, y donde las observaciones clínicas substituyeron a los antiguos cursos de conferencia basados en problemáticas especulaciones "científicas". Como ninguno de los regímenes post-revolucionarios y de la Restauración favorecía una reorganización de las Universidades, la Educación Médica en Francia no volvió a establecer su centro en las Facultades de Medicina hasta fines del siglo XIX, durante la "Tercera República". En el presente trabajo se describe el desarrollo de la Educación Médica francesa en el siglo XIX, su auge hacia mediados de ese siglo y la decandencia de dicho sistema de enseñanza cuando, a raíz del gran progreso en la Química, Histología y Fisiología, las ciencias se fueron convirtiendo, en la segunda mitad del siglo, más y más en el centro de la Medicina. Las instituciones francesas de Educación Médica mostraron entonces poca capacidad para adaptarse a las nuevas tendencias científicas. El "clinicismo" estaba allí tan firmemente establecido, que resistía a todas las tentativas de reforma, y, debido al descuido en la organización y desarrollo de las Universidades, no había en Francia Facultades de Ciencia vigorosas. Así Francia perdió su superioridad en el campo de la Medicina, la cual pasó a Alemania, donde el auge de las Universidades había creado una estructura ideal para el desarrollo de las ciencias médicas. Fué casi medio siglo más tarde, durante la "Tercera República", cuando eminentes hombres de ciencia como Berthelot y Paul Bert formaron parte del Gobierno, cuando se desarrollaron en ese país verdaderas Facultades de Ciencia, y se organizaron laboratorios para la investigación y enseñanza en el campo de las ciencias médicas. A fines del siglo, Francia tenía 6 Facultades de Medicina y 18 Escuelas Preparatorias, y hacia 1930, después de un nuevo, muy limitado esfuerzo de reforma, existían 9 Facultades y 15 Escuelas Preparatorias. El autor llega, sin embargo, a la conclusión de que ninguna de las tardías reformas de la Educación Médica en Francia fué lo bastante fundamental para que llegase ésta a alcanzar el nivel, en el campo de la Medicina científica, que en otros países había logrado, Aunque las ciencias encontraron finalmente su lugar propio en las Escuelas de Medicina, no desempeñaron nunca sino un papel secundario, y la extremada centralización que prevalece en el sistema francés de educación, ha hecho casi imposible la experimentación en el campo de la Educación Médica. Sin embargo, aun con su orientación anticuada hacia el "clinicismo", Francia ha producido hombres de ciencia de primera fila en el campo de la Medicina, y su sistema de enseñanza, que fué creado con el fin de formar médicos practicantes competentes, alcanzó, y alcanza aún, plenamente su objetivo. Y, advierte el autor, hoy día se pueden descubrir, en otros países, tendencias análogas a las "anticuadas" de Francia, aunque se use ahora nueva terminología.

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un minimum de 25 lectores.

Editorials and Comments

The Association's New Headquarters

O'N FEBRUARY 10, 1957, the Association of American Medical Colleges will dedicate its new headquarters building at 2530 Ridge Avenue, Evanston, Ill.

Throughout the early years of the Association the headquarters were maintained as part of Dr. Fred Zapffe's medical offices and it was not until 1932 that separate space for the Association was rented in Chicago's Loop at 5 S. Wabash Avenue.

With the development of the Study Section and its many files of records, it became necessary to move the office to 185 N. Wabash Avenue in 1950. It has remained there since that time, but as the staff grew from 3 to 30 persons, additional space had to be leased from time to time and in 1956 the rental bill had increased to \$17,000 a year.

After considerable discussion, extended search for other rental space, and a number of site surveys, the decision was made by the Executive Council in October 1954 to seek funds to build a headquarters building for the Association and to place it in Evanston, Ill., if a suitable site could be found. Evanston was felt to be a natural site for the building, since it provided the academic environment of Northwestern University, and yet was in close proximity to the headquarters of the American Medical Association, the American Hospital Association, and 25 other national medical societies or associations. The location in the center of the country seemed also to provide real advantages in regard to transportation and communication facilities.

A small Building Committee, with Dr. Joseph Hinsey as chairman, was accordingly named and the Chicago architectural firm of Holabird & Root & Burgee was commissioned to draw tentative plans and estimate the sum needed for construction.

The original estimate called for \$200,000 and this sum was quickly subscribed, the Alfred P. Sloan Foundation, Inc. granting \$75,000 and the China Medical Board of New York, Inc. \$125,000. Northwestern University donated a very attractive building site just northwest of its Evanston campus and just south of the Evanston Hospital.

Building costs rose precipitously after the date of the original plan and the original plans had to be cut back considerably, but in January 1956 ground was broken by the Wieboldt Construction Co. and on January 4, 1957, the staff moved into the new building.

The total cost will be approximately \$250,000. It is compact, modern and well-designed, with main floor and basement. It was designed to meet the needs of the present full-time staff. Space for temporary workers engaged in special projects will be provided as needed in the basement. If further space for full-time staff is needed, provision is made for extending the building to the west over the present parking area.

This building should not only provide a greatly improved working environment for the Association's staff members, but it should also serve as a public symbol of the feeling of unity which binds the 96 medical

schools of the U. S. and Canada together in their common task. To the China Medical Board of New York, Inc.; to the Alfred P. Sloan Foundation, Inc.; to Northwestern University and to Dr. Joseph Hinsey, the Association owes a great debt of gratitude, D.F.S.

A New Series of Teaching Films

The first of a series of films on "Medicine and the Law" was shown November 27, 1956, in Seattle before a very appreciative audience of over 600 physicians and attorneys. The purpose of this first film, "The Medical Witness," was to demonstrate to both physicians and attorneys the importance of adequate pretrial preparation and the use of graphic materials in court so that the medical facts can be plainly understood by the jury. In 30 minutes this black-and-white 16 mm. film makes very plain the right and wrong methods of presenting medical testimony by reenacting the trial of a personal injury case involving a railroad fireman who sustained a back injury from a fall.

Dr. David B. Allman, president-elect of the American Medical Association, pointed out at the premiere showing that since medical statement or testimony is required nowadays in from 60 to 85 per cent of all cases litigated, it is becoming more and more essential that the rank and file of physicians willingly assume this responsibility, prepare properly for their court appearances, and attempt to make the facts so plain to the jury that there will be less and less demand for the services of "partisan experts."

David F. Maxwell, president of the American Bar Association, emphasized the importance of developing more effective and understanding relationships between physicians and attorneys if we are to obtain the more expeditious handling of claims and suits, and the improvement in the final decision in medico-legal cases, which we all desire.

This "Medicine and the Law" series of films was first conceived by C. Joseph Steler, director of the law department of the American Medical Association. Costs will be met by the Wm. S. Merrell Company, pharmaceutical manufacturers, of Cincinnati. Selected technical advisers will be provided by both the American Medical Association and the American Bar Association. The producer is Dynamic Films of New York.

Since the general purpose of this film series is "to acquaint physicians with their essentiality in litigation and to dispel their fears of testifying in court" they should prove a very useful adjunct in the teaching program of our medical schools. Loan copies of "The Medical Witness" are available from the Film Library of the AMA, 535 N. Dearborn St., Chicago 10, Illinois, or from the Medical Audio-Visual Institute of the AAMC, 2530 Ridge Ave., Evanston, Ill. Prints may be purchased from the Wm. S. Merrell Company, Cincinnati 15, Ohio.

Report of a Fund

T HE 1956 REPORT of the Commonwealth Fund is a record of past experience, present evaluation and future development. This philanthropic trust has made a remarkable contribution to medical education in the United States—a contribution which has touched many medical

educators. For example, the Teaching Institutes of the Association of American Medical Colleges have been assisted by the thoughtful contributions of the Fund. These Institutes have actually represented a short term postdoctoral scholarship in medical education for the more than 500 individuals who have participated in them. The Fund has contributed more than money-it has contributed ideas and attitudes of evaluation which have permeated through many areas in medical education.

A philanthropic organization has an opportunity to observe programs such as medical education in a breadth of perspective which extends beyond the range of the medical educator who is often immersed in his own immediate problems. It is fortunate that the Commonwealth Fund (in this report), has set forth its observations of the changing pattern of medical education during the past 10 years.

A few observations from the report will indicate the desirability of its

careful perusal by all medical educators.

Following World War II a trend toward emphasizing the socio-psychobiological completeness of the human being was initiated through support of several departments of psychiatry-particularly in an effort to relate psychiatry more effectively to internal medicine and pediatrics. This trend was accelerated by assisting the development of departments of preventive medicine with an emphasis on having students acquire broader attitudes toward health and disease.

This trend, it is pointed out in the report, resulted about five years ago in a coalescence of various approaches which included integration of basic sciences, early and continuous contact with the patient and a con-

sideration of the social background of the patient.

The increased awareness of the diverse facts that affect the health and disease of the patient has resulted in a broad revision and intensification of effective use of the outpatient department as a teaching unit. The Commonwealth Fund has supported the development of general clinics in which the various skills, personnel and facilities that are needed by the patient are tied together as comprehensive medicine. Reports from several of these clinics, which have been published in the Journal indicate that the student may acquire a broad insight into the patients' problems through contact in the clinic and in the home.

Th growing concern with the role of the student is an interesting development in recent years. With support by the Commonwealth Fund, a number of medical schools are revising their programs in regard to integration of course material, emphasis on patient-student relationship and increased student responsibility. Attempts to measure objectively the effect of such new programs on the educational development of the stu-

dent are also being financed by the Fund.

Readers of the Journal will take heart from the sympathetic yet challenging comment in the report on the problems of the teacher. Recognizing the diverse responsibilities of teaching, research and service placed on the medical faculty, it is clear that teaching is a prime responsibility and that the rapid changes going on in the educational process require continued consideration by the teacher of his teaching methods-and attitudes.

The progress in medical education in the United States since the Flexner Report is generally attributed in large part to the fact that the medical school has become an integral part of the university. The Commonwealth report emphasizes a unique contribution that the medical school can make to the university through its utilization as the laboratory "for the study of the nature and behavior of man." Here is a challenging area for development between the medical school and other components of the university.

The Journal of Medical Education salutes the Commonwealth Fund for its achievements and recommends the report as "required reading" for all the many people who are concerned with education, particularly education in the health sciences. J. Z. B.

Do You Have Old N.Y.U. Announcements?

Efforts are being made by the New York University College of Medicine to complete the series of college announcements in the archives of their library. The following is a list of the announcements that are needed.

University of the City of New York Me	edical Department
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1842-43	1848-49	1853-54
1843-44	1849-50	1854-55
1844-45	1850-51	1860-61
1845-46	1851-52	1861-62
1846-47	1852-53	1862-63
		1845.44

Bellevue Hospital Medical College

1872-73	1875-76	
1873-74	1885-86	
1874-75	1886-87	

University and Bellevue Hospital Medical College

1903-04

1919-20

1921-22

Any of these announcements that are sent will have their postage reimbursed if desired and they should be addressed to Miss Helen Bayne, Research Librarian and Archivist of the New York University-Bellevue Medical Center.

NEWS DIGEST

Atomic Energy Symposium

A regional symposium on the peaceful uses of atomic energy was held in Puerto Rico on January 24-28. The symposium was attended by more than 1,200 college students, faculty members and professional people from Puerto Rico and a number of guests from Central and South American countries. The symposium, sponsored by the University of Puerto Rico, in cooperation with the Oak Ridge Institute of Nuclear Studies and the Atomic Energy Commission, was arranged to provide students and faculty members with a better understanding of atomic energy developments and the potentialities of the University of Puerto Rico in nuclear energy education.

Vitamin Foundation Grants

Fourteen new grants, for a total of \$78,100 were recently distributed to American universities and research institutions throughout the country to augment the program of clinical and laboratory research in the fields of vitamins and nutrition of the National Vitamin Foundation, Inc. This organization gives grants-in-aid for research semi-annually throughout the United States and abroad. Recipients of the grants include the universities of Wisconsin, Pittsburgh, Columbia, Oklahoma, Arkansas, Minnesota, New York Medical College, Cincinnati and Illinois.

Dr. Coggeshall Resumes University of Chicago Post

DR. LOWELL T. COGGESHALL resumed his duties January 1 as dean of the division of biological sciences at the University of Chicago following his resignation as Special Assistant to Marion Folsom of the Department of Health, Education and Wel-

fare. President Eisenhower, in a letter to Dr. Coggeshall, pointed out that despite the progress that has been made, there are serious needs in the health field, especially in facilities for medical teaching. Dr. Coggeshall is president-elect of both the American Cancer Society and the AAMC.

Department of Health, Education, and Welfare Grants

Seventy-three grants totaling \$24,-460,467 have been approved by the Department of Health, Education and Welfare to help institutions in 24 states and the District of Columbia build additional health research facilities. The awards were approved by the Surgeon General upon recommendation of the National Advisory Council on Health Research Facilities. Reviewing applications totaling \$66,-888,239 in requests from institutions throughout the country, the Council recommended the 73 grants for immediate support and deferred action on some 50 others. Following is a list of the grants for construction to medical schools: Alabama (\$1,033,500); Stanford (\$1,500,000); Southern California (\$854,500); Yale (\$461,612); Miami (\$941,720); Emory (\$200,000); Chicago (\$250,000); Illinois, four grants totaling \$69,500; Indiana, two grants totaling \$145,624; Iowa, two grants totaling \$95,000; Kentucky (\$1,208,992); Johns Hopkins (\$960,-000); Tufts (\$19,648); Wayne (\$900,-000); Michigan, two grants totaling \$658,522; Washington at St. Louis; two grants totaling \$220,960; New York (\$75,298); Columbia (\$366,-Buffalo (\$463.020): (\$105,000); Cincinnati (\$865,688); Ohio State (\$900,000); Jefferson, four grants totaling \$129,445; Pittsburgh (\$649,312); Pennsylvania (\$400,000); Vanderbilt (\$173,548); Utah (\$1,-500,000); Vermont (\$419,000); University of Washington, two grants totaling \$313,812; and Wisconsin (\$975,000).

Change of Name

The Journal of the Student American Medical Association has changed its name to The New Physician, effective with its January issue.

Army's General Practice Residency

Approval of the two-year Residency Program in General Practice at the U. S. Army Hospital, Fort Knox, Ky., has been given by the Council on Medical Education and Hospitals of the American Medical Association. This is the only residency program of general practice conducted by the Army Medical Service and has 16 participants. The first year of the program is devoted to medicine and medical subspecialties, including six months in pediatrics; the second in surgery and surgical subspecialties, including six months in gynecology and obstetrics.

College Briefs

Buffalo

An endowment of \$90,000 was recently received from an anonymous donor for the establishment of a chair in clinical cardiology. Dr. Eugene Lippschutz, director of the cardiovascular section of the department of medicine at the Buffalo General Hospital has been appointed to the chair, which has been assigned to the Buffalo General Hospital. Dr. Lippschutz, whose appointment was effective January 1, has been promoted from associate clinical professor to associate professor in the department of medicine.

Chicago Medical

A gift for teaching and research in the amount of \$20,000 has been made by Mr. and Mrs. David M. Copland, to be known as the David Copland Special Teaching and Research Fund.

Cincinnati

A Federal matching grant of \$865,688 has been authorized for the construction of a medicine research building. The research activities of the college will be concentrated in the new building, with the aim of improving teaching facilities. To the Federal grant will be added approximately \$1 million available to the university from a 1954-approved city bond issue.

Duke

Two medical research grants totaling \$35,388 have been made to the university. The National Institute of Neurological Diseases and Blindness has awarded \$30,388 for low temperature brain surgery research under the direction of Dr. Barnes Woodhall, professor of neurosurgery. Dr. Woodhall and his associates are investigating the possibilities of drastically lowering the temperature of the brain in order to permit operations now considered impossible.

The \$5,000 grant made by the National Paraplegia Foundation is being used for the Raymond C. Henyan Fellowship research project under Dr. Woodhall's direction. The project focuses on clinical and research training in paraplegia and basic studies upon the spinal cord, conducted jointly with Dr. George Margolis, professor of pathology.

Emory

Dr. John Willis Hurst, assistant professor of medicine has been named professor and chairman of the department of medicine. He will replace Dr. Eugene B. Ferris, who resigned as professor to accept a position with the American Heart Association. Dr. Ferris, who will be medical director of the Heart Association, will supervise the program of research, rehabilitation and community service.

Georgetown

The post of assistant dean for coordination of research has been newly created, with Dr. WALTER D. Hess, professor of biochemistry and chairman of the department of biochemistry appointed to this position. Dr. Hess will work under the deans of the medical and dental schools, assisting in the planning of research projects, and in obtaining grants for such projects. He will also be responsible for integrating individual research projects into the total activities of the medical and dental schools and the university hospital.

State University of Iowa

Dr. WILLIAM B. BEAN, professor and head, department of internal medicine, has been elected a fellow of the New York Academy of Sciences in recognition of his work in science. He is the recipient of a grant of \$45,000 from the National Institutes of Health in order to continue his work on antivitamins.

The Institute of Arthritis and Metabolic diseases of the National Institutes of Health has awarded a grant of \$20,000 per year to the following faculty members in the department of internal medicine: Dr. ELMER DEGOWIN, professor; Dr. RAYMOND SHEETS, associate professor and Dr. HENRY HAMILTON, associate professor. The Institute has also awarded a grant of \$8,000 per year to Dr. ROBERT HARDIN, professor in the department of internal medicine, to continue his work in diabetes.

Marquette

anonymous endowment \$350,000 has been received for the establishment of a chair in medicine to be known as the Francis D. Murphy Chair of Medicine in honor of Dr. Francis D. Murphy, professor and director of the department of medicine, who has served the school for the past 35 years. The income and principal of this endowment is to be spent over a period of 25 years and will presently pay the salaries of two full-time associate professors. Upon Dr. Murphy's retirement, the full-time professor and director of the department will receive his appointment through this endowment as the Francis D. Murphy professor of medicine. In 1956, Dr. Murphy received the Marquette University Alumnus of the Year Award.

Seven visiting faculty members will join the University's medical staff to present a postgraduate program on "Diseases of the Heart and Lungs" on March 6, 13, 20 and 27 in cooperation with the Wisconsin chapter of the American College of Chest Physicians.

Maryland

A charter day banquet commemorating the founding of the college of medicine of Maryland, the first school of the university, was held on January 19, at the Lord Baltimore Hotel. More than 1,000 alumni of the nine College Park colleges and five Baltimore professional schools participated in the university's charter day banquet celebration.

Medical Evangelists

Dr. Bruce W. Halstead, associate professor of preventive medicine and public health, has returned from a four-month Middle East and European expedition in search for the latest information in the area of biotoxicology. From the Middle East, Dr. Halstead and a photographer went on to tour 13 European countries in particular quest of information now

under study at various marine biological research centers.

The Second Development Conference has been scheduled for March 15-17 on the Loma Linda campus to discuss how the medical education center can meet certain needs over

the next 10-year period.

The diabetes clinic, operating through the facilities of the White Memorial Hospital and Clinic has received from the NIH—sponsored Institute of Arthritic and Metabolic Diseases an addition of \$10,000 to strengthen and expand the program now in operation. The new funds will provide for a teaching nurse and a technician plus supplies for the continued improvement of patient care.

Minnesota

Dr. Maurice B. Visscher, professor and head, department of physiology, was re-elected general secretary of the International Union of Physiological Sciences at the 20th meeting of the Congress held in Brussels in August.

Dr. Donn G. Mosser, assistant professor and director, division of radiation therapy, participated in the Institute on Cancer of the Head and Neck at the University of Nebraska.

Dr. Joel G. Brunson, instructor in the department of pathology, has been awarded a senior research fellowship from the Public Health Service to further his study in pathology.

S. U. N. Y .- Brooklyn

Dr. Jean A. Curran has resigned his position as associate executive dean for medical education in order to accept the post of full-time consultant to the Trust for Charity established by the late William Bingham 2nd of Bethel, Maine. Dr. Curran will continue as consultant to the university and professor of the history of medicine at its Downstate Medical Center in Brooklyn.

Grants totaling \$60,876 have been received for research in the departments of medicine, obstetrics and

gynecology, pathology, pediatrics and physiology. Notable among these is a grant of \$15,030 from the Public Health Service for the development of an ultrasonic camera and a study of the usefulness of this viewing device for medical, anatomical and physiological purposes which will be under the direction of Dr. Eustace E. Suckling. Included also in this amount is a grant of \$13,800 from the National Institutes of Health for a study of the susceptibility of cervical carcinoma to viruses under the direction of Dr. Irena Koprowska.

S. U. N. Y .- Syracuse

Dr. Earle L. Lipton, assistant professor in pediatrics, has been appointed the first Commonwealth Fellow under the new Commonwealth Fund grant received by Dr. Julius B. Richmond, professor and chairman of pediatrics. Dr. Richmond's grant was awarded for the training of pediatric educators interested in the social sciences and psychological aspects of pediatrics. It is a three-year grant in the amount of \$51,500.

In the department of psychiatry, Dr. Harold Basowitz has been appointed associate professor and Dr. Ivan Boszormenyi-Nagy has been appointed assistant professor.

St. Louis

Dr. ALBERT KUNTZ, director of the department of anatomy, died Saturday, January 12, at his home in St. Louis. Dr. Kuntz has been on the faculty for the last 44 years and was the author of several books on the autonomic nervous system.

Temple

A three-year grant of \$298,574 has been received from the Commonwealth Fund of New York in support of the program in comprehensive medicine. The course is designed to teach medical students a broad approach to patient care, including environmental and psychological factors as well as physical causes of illness. Dr. WILLIAM A. STEIGER, assistant

professor of medicine is in charge of the over-all administration of the course which is supervised cooperatively by the departments of psychiatry, internal medicine and social service.

Research grants from the Public Health Services totaling \$72,963 have been awarded the Medical Center. Two of the grants are earmarked for cancer research—\$36,090 for studies being conducted by Dr. Julius Schultz, assistant professor of research biochemistry of the Fels Research Institute; and \$25,000 in support of studies conducted by Dr. John V. Blady, clinical professor of surgery. The remaining grants for 6,957 and 4,916 are to support work in progress under the direction of Dr. Morton J. Oppenheimer, professor and head of the department of physiology.

No Eight-Hour Day

For every eight hours the typical American works, the typical physician devotes 12 hours to the practice of medicine—so reports *Medical Economics* in an article appearing in its February issue.

This report is based on its Eighth Quadrennial

Survey of the doctor's economic status.

The report further states that whether the doctor practices alone, in partnership, or in a group, his working hours are about the same. Nor do they vary much by income, region, or years in practice. Dermatologists generally work the shortest medical week—some 42 hours. Neurosurgeons, on the other hand, generally put in the longest week—66 hours.

Audiovisual News

The following films are now in the MAVI Library. The Fractures Series was donated by the Veterans Administration and Northwestern University School of Medicine. They are available for purchase from Churchill-Wexler Film productions.

FRACTURES SERIES

sd., color, 16 mm.

Sponsors: Department of Medicine and Surgery, Veterans Administration; Producers: Churchill-Wexler Film Productions, Los Angeles; Scientific Adviser: William Larmon, M.D., Northwestern University.

Fractures About the Elbow...... \$2

30 min., 1954

The film discusses the functional anatomy of the elbow joint and illustrates the displacing pulls of the muscle groups as they affect different fractures. The mechanisms of typical elbow injuries, such as fractures of the supracondylar, intercondylar, olecranon and head of the radius are described and various types of management including manipulation, traction and open reduction are demonstrated.

Fractures about the Knee

23 min, 1956.

The picture starts with a consideration of anatomy in the area of the knee with emphasis on the structures affecting or affected by fractures.

The fractures considered are those of the patella, intercondylar fractures of the femur, and compression and ledge fractures of the tibial plateau. Reduction, maintenance and post-operative care are visualized.

21 min., 1955.

The picture discusses the anatomy of the region about the hip with special reference to the displacing pulls of muscles as they affect various fractures, and to the blood supply to the head and neck of the femur. Sections of the film are devoted to fractures of the neck of the femur and to intertrochanteric fractures. Methods of internal fixation are shown, and the problems of maintenance of reduction by internal fixation as opposed to traction are discussed particularly with reference to the elderly patient. In this as in other films of this series the purpose is not to emphasize any method or technique, but to give an understanding of the problems and principles underlying treatment.

Fractures of the Forearm...... \$2

30 min., 1955

The complex rotational relationship between the radius and ulna is described to emphasize the importance of accurate reduction to normal functioning of the hand. The film discusses the displacing pulls of the forearm muscles and the effect of various fractures on the blood vessels and nerves in the area. Typical forearm injuries, including fractures of both bones, fracture of the shaft of the radius and fracture of the ulna with anterior dislocation of the head of the radius are described. Methods of treatment are shown, and the problems of maintenance of reduction by traction as well as internal fixation are discussed. A section of the film is devoted to suggestions for the aftercare of forearm fractures.

Fractures of the Humerus...... \$2

26 min., 1953.

Discusses the functional anatomy of the shoulder and illustrates the displacing pulls of the muscle groups as they affect different fractures. The mechanism of typical humerus fractures, such as those of the surgical neck and shaft, are described and various types of management including manipulation, traction and open reduction are demonstrated.



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ABBOTT LABORATORIES NORTH CHICAGO, JLLINOIS

Principles of Fracture Reduction.... \$7

30 min., 1953.

The principles of traction are presented in animation and in orthopedic scenes. Farmhouse emergency fracture handling by a physician in cases of ulnar, humeral, tibial and femoral fractures is demonstrated in terms of the principles while utilizing simple materials, untrained auxiliary personnel and crude methods.

The Medical Witness...

30 min., sd., b&w., 16 mm., 1956.

Shows by the examples of two physicians the right and the wrong way to medical testimony in court. Scenes show examination and crossexamination of the medical witness. Summation is provided in scenes in which the judge, "out of session," enumerates the characteristics of poor and good medical testimony.

Sponsor: Wm. S. Merrell Company in cooperation with the American Medical Association and the American Bar Association; Producer: Dynamic Films,

Inc.

Summaries of Film Reviews

Microglia (Living Human Cells in Culture Series)

11 min., sd., b&w., 1956.

A diagram of microglial cells provides contrasts with living cells functioning as "scavengers removing debris." Living Gitter cells, mature microglial cells with a predominance of splindle-shaped elements, microglia from a human melanoma and from a chromophobe tumor are seen in action at various magnifications and various time-lapse speeds.

This intriguing time-lapse cinemicrography is rich in content, rich in interpretation, and rewards repeated screenings. The implications of the material must be raised according to the utilizational patterns. The film has been assembled in workmanly fashion, is bound together by a lucid and scientifically flavorsome narration, but is charged particularly with the great inherent interest of the tissue culture materials.

Utilized by anatomists, pathologists, neurologists or neurosurgeons, the film demands far more interpretation at clinical and experimental levels, and will be highly stimulating to students and practitioners alike. DSR with KUMC Panel, December 1956.

Audience: Students of the medical sci-

Production Data: Sponsors: Abbott Laboratories, Inc.; Author and Narrator: C. M. Fomerat, Ph.D. University of Texas—Medical Branch, with Waiter Hild, E. Earl Pitsinger, and C. George Lefeber; Producer: Wynne S. Eastman Laboratory for the Medical Audio-Visual Institute of the Association of American Medical

Colleges.

Distribution: Medical Audio-Visual Institute, Association of American Medical
Colleges, 2530 Ridge Avenue, Evanston,
Ill., Rental; \$2: Sale: \$25; Abbott Laboratories, North Chicago, Ill., Lean.

Oligodendroglia (Living Human Cells in Culture Series)

12 min., sd., b&w., 16 mm., 1956

The "typical" oligodendroglia cells are shown, with their rhythmic pulsatile activity, and their linkages in chains and networks. The wide variety in cell forms is demonstrated. An astrocyte from the rat corpus callosum shows great activity of the philopodia. Multipolar cells of rhythmic activity emphasize the problem of precise cytological classification. Cells from a lobotomy specimen, from an astrocytoma, and from a resected tumor show the typical rhythmic contractility. A graphic analysis of cell sizes provides a summary.

This extraordinary tissue culture material raises far more questions than it answers. The dynamic qualities of living cells are splendidly shown-whatever the changed environmental factors of tissue culture as against cells in situ, particularly since glial cells are generally conceived to be fixed and supportive elements. Productionally, the film is workmanly and didactically descriptive, but is dominated by the inherently remarkable qualities of the preparation.

For students of histology, pathology, neurology and neurosurgery this film will be very provocative. Expert interpretation will be required. DSR with KUMC Panel, December 1956.

Audience: Students of the medical sciences.

Production Data: Sponsors: Abbott Laboratories, Inc., Author and Narrator: C. M. Pomerat, Ph.D. University of Texas—Medical Branch, with Charles Lumsden, Curtis Haskins, and C. George Lefeber; Producer: Wynne S. Eastman Laboratory for the Medical Audio-Visual Institute of the Association of American Medical Colleges. Distribution: Medical Audio-Visual Institute, Association of American Medical Colleges, 2550 Ridge Avenue, Evanston, Ill., Rental: \$3: Sale: \$35 Abbott Laboratories, North Chicago, Ill., Loan.

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Journal of MEDICAL EDUCATION

The Termination for the Bile Duct

20 min., sd., color, 16 mm., 1955.

Drawings present the gall bladder as a "surge chamber" for the biliary tract. Dissected bile duct specimens impaled on needles show how the terminal common and pancreatic ducts produce the papilla mass. Specimens and drawings of the specimens show variations of the terminal duct patterns; in only 5% is an ampulla present. Calculus producing dilatation, and diverticulum with fistula to the pancreas are shown as pathologic entities.

This is an interesting report film on the anatomy of the terminal bile duct, with two pathological specimens for contrast. One would wish for footage on the method of specimen preparation, for more contrasting intra-ductal dyes for the semicleared specimens, for demonstration of some functional test for potency, for orientational shots of the duodenal surface at the papilla, and perhaps for more pathology (since pathology often serves to demonstrate underlying anatomy). Production could be greatly improved with better titles, a better way of rotating the specimen to preserve audience orientation, and registered drawings to match the real speci-

For surgeons and physiologists, and for students of anatomy and pathology, and intriguing new view of a small but important anatomical structure. Maximum utilization may be hindered by the film's technical shortcomings, although its scientific contribution is undeniable. DSR with KUMC Panel, November 1956.

Reference: The Biliary Tract, Williams & Wilkins, Baltimore, 1955.

Audience: Students of anatomy and surgery.

Production Data: Author: Julian A. Sterling, M.D., University of Pennsylvania; Producer: Al Kane Productions, Philadelphia for Davis & Geck, Inc.
Distribution Data: Surgical Products Division, American Cyanamid Company (Davis & Geck, Inc.), Loan: Medical Audio-Visual Institute, Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Ill. Rental: \$7; Al Kane Production, Inc., 1411 Walnut Street, Philadelphia, Sale: \$100.

Stress and the Adaptation Syndrome

35 min., color, sd., 16 mm., 1956

Out of the welter of research efforts "A concept occasionally comes forth which relates to all medicine." In the case of the General Adaptation Syndrome "it all started with a study of ovarian extracts" and the pursuit of a possible new ovarian hormone. Instead of a hormone, a nonspecific triad of changes deriving from many kinds of trauma was found in rats: gastric nemorrhage, involution of the thymus, enlargement and hyperemia of the adrenals. Physical and chemical injury, physiological stimuli and infection was seen to have both specific and stereotyped nonspecific effects; these latter were conceived by Selye to comprise what he termed the general adaptation syndrome. With cold as the stressor, the three stages of the G.A.S. are demonstrated in the film: Stage 1, alarm, Stage II, resistance, Stage III, exhaustion. The underlying mechanisms of the triad of pathology are sketched, as far as they appear to be known. The roles of ACTH and STH, of pro-inflammatory" desoxycorticosterone and antiinflammatory hydrocortisone are demonstrated in rats. Utilizing the granuloma pouch produced with subcutaneous injection of air, followed by dilute croton oil, the actions of hydrocortisone and desoxycorticosterone are elucidated in part. Prolonged DOC is shown to produce periarteritis, nephrosclerosis and nodular myocarditis. "The Theory of Stress in Contemporary Medicine" was one of the major targets of the 1955 International Medical Congress in Verona, Italy.

This film undertakes the difficult task of making reasonably clear a new modern concept of disease; it succeeds in achieving the simplifications demanded for clarity perhaps as well as this is possible in so complex and debated an issue. One would wish that the human clinical implications of the experimental animal data might be given in a few cautiously selected cases; perhaps this will be a sequel. Film skills are excellent and the visual literacy of production is first class. More extreme closeups and a better method of showing photomicrographs would have been helpful even in this superior production.

For all students of every branch of medicine this film has fundamental importance. Indeed, the film might well be seen annually by every medical student to refresh his knowledge of one of the apparent underlying phenomena of disease. With faculty commentators of many specialties, the implications of the General Adaptation Syndrome can be given appropriate richness. DSR, with KUMC Panel, December 1956.

Audience: All medical students and practitioners.

Production Data: Sponsor: Pfizer Labatories Div., Chas. Pfizer and Co., Inc. Scientific Advisors: Hans Selye, M.D. et al; Script: Leo L. Leveridge, M.D. and Norman P. Schenker, M.D.; Direction: Norman P. Schenker, M.D. and Nat Campus: Production: Research and Scientific Films, Inc. and Campus Productions, Inc. Distribution: Pfizer Laboratories, 630 Flushing Avenue, Brooklyn 6, N.Y., Lonn.

General Adaptation Syndrome

Part I. 44 min., color, sd., 16 mm., 1949 (PMF 5151)

The stages of stress are seen in diagram demonstrating specific and crossed resistance. With a master blackboard diagram Dr. Hans Selye presents the relationships of stress as they involve the pituitary, adrenal, kidneys and blood vessels. Rat experiments show the alarm reaction in general stress, with formalin given subcutaneously, spinal cord transection, starvation and bowel trauma. Effects of hypophysectomy, adrenalectomy and nephrectomy with and without replacement hormonal therapy elucidate factors of stress.

Part II, 35 min.

In a series of rat experiments Selye continues to develop the basis for the concept of the General Adaptation Syndrome. Various stressor—host reaction situations are experimentally created and results demonstrated: cold, cord transection, nephrectomy, hypophysecto-

my, dietary stringencies, DOC, high and low salt, adrenalectomy with cold. A diagram of the chain of physiological reactions indicates something of the role of endocrines in problems of internal medicine, and the concept of diseases of adaptation.

This film comprises a series of laboratory animal experiments strung together with a blackboard schema and an expository narration. It is an interesting if lengthy introduction to Selye's ideas and methods of expermentation. The human clinical implications of the General Adaptation Syndrome would make an interesting third reel. Filmically, the film has one striking and recurrent deficiency: there are never big enough closeups of the animal surgery, gross organs, etc. The film is wooden, unimaginative, in structure a filmed lecture.

For all students of medicine, this film can be provocative and interesting despite its length and clumsiness. Obviously, teachers trained in the concept and implications of stress will strongly aid any classroom utilization. DSR, with KUMC Panel.

Audience: Students of the medical sciences.

Production Data: Sponsor/Producer: Armed Forces Institute of Pathology, U. S. Army, Scientific Adviser: Hans Selye, M.D., University of Montreal. Distribution: Armed Forces Institute of Pathology, Walter Reed Army Medical Center, 6225 Sixteenth Street, N. S., Washington, 25, D. C. Loan.

Book Reviews

The Management of Fractures, Dislocations, and Sprains,

Key, J. A. and Conwell, H. E.: St. Louis, C. V. Mosby Co., 1956

This is the most voluminous of the American texts on fractures (1168 pages); it is comprehensive and describes the very old and safer methods as well as the very new and more controversial operative methods. This is the sixth edition of a book that has been published over a period of almost 25 years and has been highly respected by four generations of interns, and is likely to hold its place in the top three in almost 100 fracture books in all languages of the world. A good place for the new edition is on a chain in the emergency room or in the surgeons' lounge; it is heavy enough to discourage some students from carrying it out of the library; in the modern hospital the interns' quarters are generally too far away from the patient to encourage him to make full use of his own copy.

It is almost traditional for reviewers of this book to criticize the illustrations. Many have been replaced and improved but there are still many that are black on white reproductions while some are white on black photographs of x-ray films of fractures obscured by plaster encasement. Some are difficult for the beginner to interpret and should be retouched throughout rather than just occasionally in the book.

The sixth edition is not a complete reference book because the bibliography, the names of authorities, and references to the literature are inserted only casually in the text, in footnotes, or entirely omitted. The writing has always been done with a personal style in which the authors refer to themselves as "we" or by their initials as individuals. Their presentation is sometimes confusing as for example on the subject of aftercare of traumatic dislocation of the hip-"We do not believe that prolonged immobilization or freedom from weight-bearing is the only factor in aiding the prevention of aseptic necrosis."

A new section purports to cover war wounds and war fractures but it lacks succinctness on the proven-value of a well padded plaster cast for transportation and of skeletal traction with Kirschner wires and free suspension for definitive treatment as shown by experience in both World Wars. No mention is made of the combination of burns and fractures, the dreaded combination of injuries sure to occur in atomic warfare.

The section on "Colles' Fracture" is excellent. The detailed directions on the use of both conservative management and operative methods are useful and practical.

The chapter on repair of fractures including delayed and non-union lacks cognizance of recent advances in the knowledge of physiology of bone and connective tissue.

For the crowded curriculum of the present day medical student and intern the smaller or even the pocket size fracture book is preferable; for the resident and advanced student of surgery and orthopedics, the sixth edition of this book is the most complete compilation.

Marshall R. Urist, California (L. A.)

Concise Anatomy

Linden F. Edwards, Ph. D., McGraw-Hill Book Company, New York, 1956. 2nd edition. 502 pp.

This book represents a rather successful attempt to present, by careful selection of text and illustrations, a useful treatise for a shorter course in anatomy. The author does not suggest at what level he expects the book to be used, quite wisely leaving that for others to decide. Both the text and bibliography bear witness to a wide interest in biology.

Part 1, about 100 pages, is divided into seven chapters entitled successively: general microscopic and developmental anatomy, general osteology, general arthrology, general myology, general neurology, general angiology and general dermatology. This is adequate, well selected and well organized

and perhaps represents the major contribution.

Parts 2 to 6, about 400 pages, are routine descriptive anatomy with emphasis on function as well as on morphology. The organization is regional. Each part is divided into several chapters and at the end of each chapter is a well chosen discussion of applied anatomy.

There are, of course, both in the text and illustrations, minor points that one could criticize adversely. In general, however, the book is what its title suggests, a concise anatomy of high quality.

Walter E. Sullivan, Colorado

Surgery for General Practice

Victor Richards, M. D., Published by the C. V. Mosby Company, 1956, St. Louis.

This book has been well done. The author's objective in writing the volume was to provide a better organization of facts already available in the field of surgical material ordinarily encountered by the general practitioner. The reviewer was particularly interested in learning what the author considered to be the surgery which should be performed in general practice. Few can have serious disagreement with the material which is contained in this volume. Certainly any general practitioner might well be called upon to manage the minor surgery discussed and to provide the immediate emergency care of certain more complicated conditions.

Furthermore, many of the more complicated common emergencies are described with surprising clarity and brevity. The illustrations are excellent throughout. In fact, the brevity of pertinent comment and the clarity of the illustrations would appear to the reviewer to represent the major and most attractive feature of this volume.

The volume was written for the general practitioner and it will be of value particularly to this group. The necessary and planned omissions render the book of limited value to the medical student as a textbook of surgery, and the volume is of course of no great use to the surgical specialist. Even here, however, the clarity of the illustrations and brief comment would be of value to anyone performing the procedures described. Since the volume was written for the general practitioner and would appear to be of particular value to this group, the criticisms mentioned were accepted by the author before the volume was written. Perhaps the only objection which the reviewer might raise is the author's decision to include no references. It is true, of course, that most of the material covered in the volume is common knowledge to many of the profession. On the other hand, one doubts very seriously whether any single person could write such a volume without frequent reference to the works of others, and it would appear arbitrary to exclude all references on the basis that this work was known to all.

James D. Hardy, Mississippi

Essentials of Histology

Third Edition By Margaret M. Hoskins, Ph.D. and Gerrit Bevelander, Ph.D. The C. V. Mosby Company, St. Louis, 1956, 254 pp. 84.00.

The descriptive account of cells, tissues and organs is concise, clear and accurate. The text is appropriate for an elementary course, and for introduction or review in more advanced courses.

The illustrations are simple and immediately useful to students. A few such as figures 51 (lymph node, cat) and 57 (thymus, monkey) seem of little value. The introduction is inaccurate (page 17) concerning relative amounts of DNA and RNA in nucleus and nucleolus. Glycogen is mentioned as a cytoplasmic component, but not the rather commonly present (and observed) RNA.

The tables, outlines and summaries aid in understanding tissues and organs, and processes such as osteogenesis. Unfortunately there is not a simple chart of blood development. Color plate (I) of adult blood cells in a smear of peripheral blood is directly related to study of such smears Study of hemopoiesis would be aided by replacement of plate II (section of bone marrow) with an illustration showing significant cells of the developmental series as seen in a smear of bone marrow.

The chapter on endocrines contains (page 217) an erroneous statement about Addison's disease and a rather broad one concerning the sites of epinephrine action. It should be included that adrenal cortical hormones can now be classified as glucocorticoids and mineralocorticoids.

Difficult subjects including osteogenesis, development of teeth, and cellular composition and arrangement of renal parenchyma are presented with unusual skill and brevity. Students should be

5 macmillan

the management of abdominal operations revised edition Rodney Maingot, F.R.C.S., editor A major reference work to which thirty-three of Britain's most renowned authorities contributed. two volumes, 1,350 pages, March 1957, imp. probably \$32.00 textbook of gynaecology for students and practitioners James Young, M.D. tenth edition Well organized, completely up to date, plus two new chapters. Excellent color plates, charts and diagrams. Distinguished further by a clear writing style. 492 pages, illustrated January 1957, imp. probably \$9.00 sequeira's diseases of the skin sixth edition John T. Ingram, M.D., F.R.C.P. and Reginald T. Brain, M.D., F.R.C.P., editors A magnificent volume with 63 color plates and 426 text figures. Impressive. Fine for reference or study. 523 pages, illustrated, January 1957, imp. probably \$18.00 from witchcraft to world health Samuel Leff, M.D., D.P.H., and Vera Leff An interesting historical survey of healing and curing methods from primitive man's efforts to recent preventive medicine. illustrated, February 1957, imp. probably \$4.50 smoking and its effects Sidney Russ, C.B.E., D.Sc. Facts about various smoking habits, materials (including opium, hemp and tobacco), and their effects. A second section presents, unbiased, the results of cancer studies. \$1.95 illustrated, January 1957, imp. ORDER NOW the macmillan company, box jma-1, 60 fifth avenue, new york city 11, n. y. please send me -1 0 2 0 3 0 4 0 5 0 bill me 🗆 check enclosed [(publisher pays delivery charge if payment is made when ordering) name street city, zone, state

pleased with the clarity and direct approach used in the writing.

W. Lane Williams, Minnesota

Textbook of Biophysical Chemistry

Edward Staunton West, The Macmillan Company, New York 1956. Price \$7.00

The present text represents an expansion and revision of the same author's Physical Chemistry for Students of Biochemistry and Medicine which was originally published in 1942. The new book contains 12 chapters, the first 7 dealing mainly with fundamental concepts of physical chemistry. The last 5 chapters also present some physico-chemical principles but are primarily concerned with applications to respiration and acid-base balance, and to the energetics involved in metabolism. In effect, about half the book deals with essential background for the student of biochemistry or medicine and about half with material which is presented in all modern courses and textbooks of biochemistry. Although all the material is well-presented, there may be some doubt as to the desirability of asking the student to buy a book which duplicates considerable material which is available to him elsewhere.

There is no doubt that one of the most serious problems in modern medical education is the desirability of giving the student a strong background in biophysics and biochemistry, yet few medical schools require any preparation in physical chemistry. Teachers of biochemistry and physiology face the unfortunate choice of expurgating their presentations to the point where many of the most significant developments of the last decades are slighted or ignored or of spending much of the time teaching principles which should have been learned by the student in his undergraduate years. Books such as the one in hand attempt to resolve the dilemma by a selection of the principles of physical chemistry essential for an understanding of medical science (as distinct from the art). It is probable that the book will find its greatest use among students of the biological sciences, who will find it an excellent way to brush up or review these principles, rather than among medical students already overburdened by a heavy curriculum. Perhaps it is not too early to plead for a changed outlook in premedical requirements. In the meantime, such books as this one can be highly recommended for supplementary study.

Emil L. Smith, Utah

The Human Body: Its Anatomy and Physiology

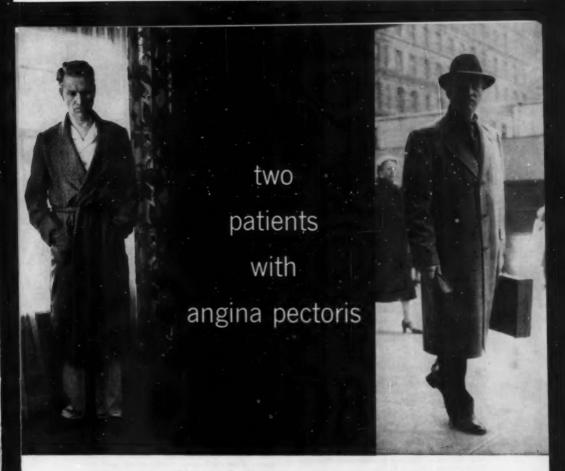
C. H. Best and N. B. Taylor, Third edition. Henry Holt & Co., N. Y., 1956.

The usefulness of this book has been broadened by the changes which have been made since the previous edition. The portions dealing with anatomy have been greatly expanded. The physiological material has also been expanded but to a much lesser extent. However, even with these changes, the book can only serve as a text for the most elementary college level. The inclusion of more anatomy has increased the desirability of this book as a text for special groups who take a combined elementary course in physiology and anatomy.

The book contains many diagrams which should prove useful in stressing physiological and anatomical principles. A helpful appendix and a list of reference texts have been added following the glossary.

The sequence of the material will for the most part find general acceptance without alteration. However, the nervous system is not discussed until the last third of the book and objection might be raised to this sequence as some teachers of physiology prefer to present the essentials of reflex action before considering reflex regulation of organs.

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References: 1. Rosenberg, H. N., and Michelson, A. L.: Am. J. M. Sc. 230:254 (Sept.) 1955. 2. Kory, R. C., et al.: Am. Heart J. 50:308 (Aug.) 1955. 3. Winnor, T., and Humphreys, P.: Angiology 3:1 (Feb.) 1953. 4. Plotz, M.: New York State J. Med. 52:2012 (Aug. 15) 1952. 5. Dailheu-Geoffroy, P.: L'Ouest-Médical, vol. 3 (July) 1950.

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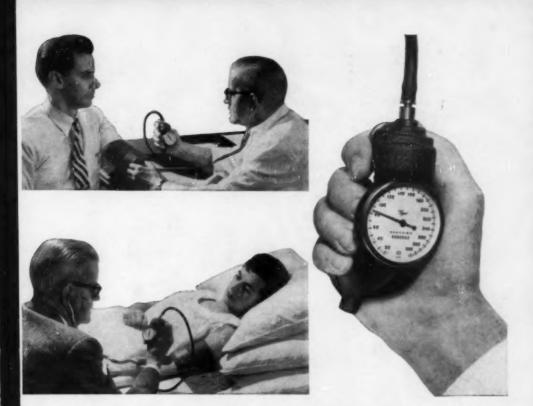
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